PORTRAIT DE PIERRE FAUCHARD.

Attribué a Netscher, 1726.

(Copied from a photograph of the original oil painting.)

The Fourth International Dental Congress.

The Fourth International Dental Congress convened at St. Louis on the morning of August 29th, Mr. Rogers, the Director of Congresses presiding until he had declared Dr. H. J. Burkhart elected president. Dr. Burkhart then took the gavel and Dr. E. C. Kirk was made secretary-general, and Dr. M. F. Finley, treasurer. The various honorary presidents, vice-presidents, foreign delegates and officers of the sections, were then invited to the stage and presented an imposing body of representative men. The subsequent proceedings were quite impressive, including brief addresses in behalf of the various countries by their delegates, nearly all of whom spoke, and spoke well, in the English language. The countries were called in alphabetical order, thus avoiding any friction due to giving precedence, a method which was most praiseworthy, especially as it placed the United States at the end, a fitting position for the host.

It might almost be said, that the interest in the Congress as a Congress, died at the adjournment of this session. Thereafter the meetings followed the thoroughly well known and recently abandoned system which so long has marred the National Dental Association.

There were morning sessions of the main body, before which a few papers were read, selected by no previously announced rule. The afternoons were given over to meetings of the sections, and if the ignominious failure of this method of managing a dental meeting, which must be recorded in connection with this Congress, would only result in its final

abandonment in this country, at least one great good will have been achieved by this Fourth International Dental Congress, which was International in character, only at one session.

Absolute Failure of the Section System.

Let us mention a few of the unpleasant features of working by sections, and then discuss the reasons therefor. It must first be recorded, however, that it was reported that no less than sixteen hundred dentists joined the congress. Just how many actually attended was not made known, but probably a thousand; possibly more. Let these figures be borne in mind. The meetings of the section on operative dentistry were held in the main assembly room, and whether for this reason, or not, the sessions were fairly well attended, as many as one hundred being occasionally present. The prosthetic section had trouble from the start, its very first session being adjourned for lack of an audience. On other days the attendance fluctuated between five and forty, the latter being a generous estimate. Yet surely this section, dealing with the every day work of the dentist might reasonably have looked for greater support. The same list of papers, if offered at almost any State society meeting would have attracted from two to five hunderd men, according to the locality. The Odontographic Society of Chicago with only five papers, two years ago, had twenty-six hundred.

There were so many delays, waiting for auditors, and the sessions for the same reason were so short, in this section, that at the last there were several important papers by men from abroad, all of which were crowded into one slimly attended session, and read so hurriedly that discussion perforce was cut off.

Think of the feelings of the gentlemen who crossed the ocean to read papers, when they found themselves in this great American land, among the men that boast so of American dentistry, to be met, as these were by less than twenty auditors? But there was worse even than this. Dr. Guerini, of Italy brought into this section several exceedingly interesting examples of prosthetic work, which he desired to show and explain, such as swaged aluminum plates; gold plating on aluminum; soldered aluminum; an exceedingly ingenious spring for use in connection with obturators; but Dr. Guerini never was reached at all, and as he expressed it, he "packed his things and took them back to Italy." It became the painful duty of the section officers to apologize for that, for which there was no excuse, and this was all the more difficult as this same gentleman had brought a paper which he had been especially requested to prepare; a paper which must have cost him endless work, as it included a resume of the literature of dental art in Italy; nevertheless, Dr. Guerini complained that he had on two different days repaired to the proper section with his

paper only to find no one in attendance. This circumstance was brought to the attention of Dr. Burkhart, and subsequently opportunity was afforded to Dr. Guerini to read this paper.

Dr. E. Sauvez, of Paris, not being able to speak English as fluently as he would have wished (though quite to the satisfaction of the Americans who had the pleasure of hearing him in an after-dinner address at the banquet of the Interstate Dental Fraternity), had his paper not only translated into English, but he assumed the expense of printing it in pamphlet form, bringing with him for distribution among the members two or three thousand copies. The subject was certainly one of vast interest, "Local Anaesthesia." Yet in spite of the importance of the subject, in spite of the distance he had traveled, in spite of the fact that he was our guest and we were presumably playing host, when the time for reading his paper arrived just four men were present in the section.

But even this record was beaten. Our own Dr. Cryer, whose papers are always fine, brought to this Congress one in connection with which he used the lantern and showed the finest radiographs of jaws ever seen, including some that were stereoscopic in character. Yet Dr. Cryer was allowed to sit for an hour in his section in the sole companionship of the gentleman in charge of the lantern and the stenographer. Finally, Dr. Ottolengui passed through the room, having been previously engaged in the orthodontia section reading his own paper, and Dr. Cryer invited Dr. Ottolengui to preside, while he read his paper, and this Dr. Ottolengui did, esteeming himself much honored to be the whole audience before which Dr. Cryer was willing to deliver his lantern lecture.

An auctioneer sometimes begins a sale with none present but his own clerks, hoping that the sound of his voice may attract the passerby. And thus it was in this instance. The pictures on the screen caught the eyes of a few stragglers, until a full dozen were present. But as soon as discussion was called, they faded away, and then it was seen that the visitors had been mere gallants with their dames, seeing the sights. They were not dentists at all. Yes, there was one, just one left out of the phantom dozen, and he and Dr. Ottolengui discussed the paper. Was this incident far short of being a disgrace?

Other splendid papers brought over by distinguished foreigners were not even offered, when the authors saw how small their audiences would be. We are glad to state that some of these have been secured for publication in ITEMS OF INTEREST.

The orthodontia section was practically a success, though even here the attendance never was large. The success here was due to the presence of the members of the American Society of Orthodontists, who gave almost all their time to this one section. Why? Because orthodontia is

the only dental specialty which is really an organized separate specialty of dentistry, and therefore orthodontia is the only field of work which can fittingly be represented by a section.

Causes of the Failure of the Sections.

This brings us to a consideration of the reasons for the failure of the sections. These may be divided into two classes, under the nominations, bad management, and bad method, the latter undoubtedly predominating. Even with good management this section scheme must have shown poor results, though undoubtedly better.

The Fourth International Dental Congress, presumably was projected as a convention at which the dentists of the world might exchange views on subjects relative to their calling. It primarily resolved itself into the finest display of dental goods the world has ever seen. This great show, was continuous, open uninterruptedly from sunrise to sunset, and if there were a thousand dentists at the Congress, about eight hundred were in the exhibit rooms all the time. This left about two hundred to visit the meetings of the ten sections, taking no count of those that went to the World's Fair. Let us pause here to take a note. The World's Fair buildings were closed every evening; thus those that wished to see their interiors were obliged to go during daylight. Yet, the Congress did not have a single night session.

To return to the matter of the exhibits, it has been explained that the exhibitors refused to take space unless permitted to remain open continuously, and at the time of making contracts with them it seemed essential to have them—and their money. There is no doubt that exhibits are an important item in making a meeting successful, and we must not be misunderstood as arguing against exhibits, but we do think that the exhibition of dental goods should be subordinated to the reading and discussing of scientific papers, more especially when we are supposed to be receiving guests from foreign lands. Moreover we think the end might have been attained, even though it were necessary to give the exhibitors all day in which to show their wares.

Another bit of mismanagement which militated against success of the sections, was the absence of bulletins. A large board at the entrance, containing official and correct announcement of each day's doings would have helped mightily.

But, after all, the main trouble lay in the system. Seemingly, because medical conventions have sections, it has been thought necessary for dentists to conduct their larger meetings in similar fashion. But there is no logical analogy. The medical world is finally split into definite fields of work, fields in which the worker is exclusively occupied within definite limitations. A section on surgery attracts the surgeon. A section on

gynecology, the gynecologist. A section on chemistry, the chemist, etc., etc. It is quite different in dentistry. The sub-division into specialties is in its infancy. Orthodontia is the only specialty in dentistry, which at present has any real separation, and it is this fact alone which made the section in the Congress devoted to this subject more successful than any other, except operative dentistry. Yet there are probably not more than fifty orthodontia specialists in the whole United States. In the present state of affairs, then, we should recognize that dentistry is just dentistry, and that the dentist is interested in all that pertains to his work. If imaginary lines be drawn, and men are forced to work in fields separated from the general theme, the workers will be few, even though the work itself may be better; and for like reasons the audiences will be slim.

Viewing a programme divided into ten sections, the plain dentist finds himself at a loss to know which room will offer the most pabulum. He may find several papers in different sections which he would particularly desire to hear, and should he attempt to be present, most likely he will find them all called for the same hour. An actual fact sometimes points a moral better than any argument. A certain dentist had been asked to open the discussions on three papers at this Congress. In each instance his name had been sent to the committee by the essayist; thus each essayist thought this particular man qualified to discuss his paper. It chanced that all three papers were called for exactly the same hour, in three different sections. Of course it was physically impossible for him to be in three places at once, and this is the turning point of the argument. It should not be a physical impossibility for any member of a Congress to hear all of the papers. On the contrary it should be made possible for every man to hear every paper.

The Remedy.

It would be manifestly wrong to criticize, without showing a means of improving the method. There is of course some good to be attained by section work. Without going too deeply into this phase of the subject, suffice it to say that it assures a diversity of topics. At one time the American Dental Association, worked in section which were nominal only. Papers were read by title in the sections, and then read in full before the main body. This insured an audience, but it allowed one or two sections to monopolize a whole meeting. The method at the present Congress was the reading of papers before the sections, and each section was obliged to attract its own audience. The evils of this have been, in part, pointed out.

If it be deemed wise to work by sections in the present status of dentistry the divisions should be as broad as possible. The three section plan, recently adopted by the National, will surely be better than ten. But

the reading of papers in sections, and especially if the various sections meet simultaneously, must prove disastrous by dividing the interest.

Let us suppose that in the last Congress there had been three sections, sub-divided if necessary into three parts, or sub-sections, it being understood that these sections and sub-divisions were made merely for the purpose of systematizing the matter to be obtained and offered at the Congress. Suppose a rule requiring all papers to be in the hands of a committee for consideration at least one month prior to the opening of the Congress.

On the morning of the first day, the organization of the Congress. In the afternoon, meetings of the three sections, each to receive the reports of the essay committees; such committees to report all papers received, and to recommend, first, papers to be rejected; second, papers to be read by title only, and published in the transactions; and third, papers to be presented to the Congress. As one argument for this part of the method, be it said that much valuable time was spent on papers which should have been read by title only; while some of the best papers were read by title for lack of time, or lack of attendance. On the evening of the first day, the Congress would have been placed in fine condition for real scientific work. This session should have been devoted to papers from Section 1. The mornings might have been free, and a meeting of the full Congress could have occurred each afternoon and evening, excepting one evening for the banquet. The sections could have been taken up in rotation (according to this plan where would have been but three sections). Each section could have had two meetings, before the full body. There would have been ample time for clinics. The exhibits would not have noticeably interfered and what is equally important, since thus far all our Congresses have been adjuncts of World's fairs, the mornings spent visiting the Fair, would not have taken the men from the scientific meetings.

In spite of all difficulties, however, a number of most excellent papers were read, and we take pleasure in announcing that the next number of ITEMS OF INTEREST will be devoted exclusively to these with the discussions thereon. Thus we will offer our readers the cream of the scientific programme in a single issue.

We publish this month as a frontispiece, a portrait of Pierre Fauchard made from the only photograph extant. This photograph was made from the original oil portrait mentioned in the paper of Dr. George Viau, professor in *L'Ecole Dentaire,* which was read by Dr. Truman M. Brophy at the second meeting of the full Congress, under the title "Apropos of a Portrait of Pierre Fauchard." The following is an abstract:

"Apropos of a Portrait of Pierre Fauchard."

There were many dentists before Pierre Fauchard in the town of Paris, and even in 1700 no one was allowed to practice there without having submitted to an examination by three surgeons appointed by the municipality.

Pierre Fauchard in eliminating from our profession a number of absurd practices, in relying only on well observed clinical facts, and knowing how to draw logical deductions from those—in one word, in being in advance of his time—could have transformed the practice of his day had he had more pupils. His influence, however, though less than it should have been, was not null, and his work was one of the principal foundations on which has been built up the information necessary for an educated practitioner.

No matter to what nation we belong, we honor ourselves in preserving his memory. He was one of the greatest of those who blazed the road for us.

We find that Fauchard was at first prevented by his family from entering the profession of dentistry, but he was destined to be master in it.

He was also the first to practice antisepsis, before the word itself was employed, by using oil of cinnamon for that purpose.

Pierre Fauchard died at his home on March 25, 1779, after a long and fruitful life. He had all the qualifications for the head of a school—common sense—clearness of conception. The importance of his work is such that in our profession historically, it may be compared to that of Ambrose Paré for general surgery.

It will be easily understood that having read his history, one of the joys of my life was the discovery of an authentic portrait of Pierre Fauchard. This is how I became the possessor of it: This portrait previously formed part of Dr. Cusco's collection. I knew Dr. Cusco, and had an opportunity of visiting his collection, which contained besides portraits, instruments and apparatus of ancient surgery, a remarkable library. I ing the rarities contained in the collection and seeking to know the names me suppose Dr. Cusco himself did not realize to what extent this work of art would interest our profession; otherwise he would have pointed it out to me. On his death, there was a sale, in which I was interested. Knowing the rarities contained in the collection and seeking to know the names of some of the portraits, I discovered on the back of one of them the name "Pierre Fauchard, 1726." Higher up was the name of the painter, Netscher.

Discussion.

Dr. A. H. Thompson, Topeka, Kansas. I am always impressed by the early geniuses of our profession, who brought it from chaos, and gave it something of a standing. To me there is always an inspiration about these men, and when we study their lives, we feel as though there was something uplifting about them. These men deserve great credit for what they did, because they had nothing back of them to build on as we have. We are accustomed to saying that genius plus environment makes men great; but many of these men did not even have environment; they made their own environment. We should study what men can do, who give themselves to such a life. We should therefore be grateful to the gentleman who unearthed this portrait, and gave it to us.

Dr. William Crueman, Philadelphia, Pa. At this stage of the history of our profession, it would be difficult to give too much credit to the great Fauchard—the first in the world's history who wrote a work that can be called a text book on dental science. It was written in 1723, but held from publication for five years, because he was not quite satisfied that the facts there stated were all facts. I am well aware of what has been done since then, but no work took the compass which his did, nor was as good an exponent of the science, as was his at the time it was written. It is much to be regretted, I think, that when the American Association of Dental Surgeons republished a number of the older dental works, that this work was neglected, for although it had been before the world for so long, it was so far in advance of its time that works afterwards published were not of such great value. We have gained our dental science from a dental source, without being able to read the language in which it was written. Being an English-speaking people, we paid more attention to the works written in English, to the neglect of the others.

I think it is quite an honor that an original portrait of Fauchard has been brought to this country to remain here.

Dr. Charles Godon, Paris, France. I am pleased that my friend Viau, of Paris, found this portrait of our great ancestor, Pierre Fauchard. We call him in France, the father of French dentistry because I think our period of scientific dentistry begins with the first book, the first journal and the first school. I think we had the honor of having the first book on dentistry or dental surgery. Pierre Fauchard wrote this book in 1728, and it was called the *"Chirugien-Dentiste."* The American dentists had the honor of having the first school, in Baltimore, in 1839.

Those are dates we should remember—the first book, the first school, the first journal.

It would be very interesting to us to know many things about the history of the man who had the honor of making the first steps in scientific dentistry, and this picture recalls to us one part of the life of this great father of scientific dentistry.

I thank my friend Viau for finding this picture, and my friend Sauvez who brought us this communication and this picture. I shall be pleased to leave two copies in America, one for Dr. Kirk for the Philadelphia Dental School, and the other for Dr. Brophy's school in Chicago.

Dr. Grevers, Amsterdam, Holland.

It was with great pleasure that I listened to the communication of Dr. Viau, of Paris, and saw this original picture of Pierre Fauchard. In the introduction of his book, there is a delineation of what a dentist should be, personally and in his habits. His successors have largely used this book to give information to their readers. The illustrations are very coarse, certainly; yet you find very good representations of anomalies of the teeth. True, Fauchard must have borrowed from older writers, for you know Arculanus was the first to mention filling teeth with gold. It is a great pity that when the archives were published by the American society, that the book of Pierre Fauchard was omitted. If it were translated into English, even at this date, it would be a great source of information to many who have not yet read it.

Dr. Burton Lee Thorpe, St. Louis, Mo.

I am much pleased that this contribution to dental literature and history has been brought before us. Fauchard has occupied a very prominent place in the history of the dental profession. He has stood out as the man who was the progenitor of dental surgery, and the influence of his work has been handed down to us through the pioneers who came to America at the time of the Revolution. These men—Lemaire and Gardette—followed the teachings of Fauchard and introduced dental surgery into America. Fauchard was a medical man, and he gathered the scattered fragments of dentistry that had been practiced by medical men and really inaugurated a dento-surgical section of the dental profession.

His name, I think, is the most prominent of the European pioneers, and he occupies the same position in France as Chapin A. Harris and Solyman Brown occupy in America.

Dr. Truman W. Brophy, Chicago, Ill.

I want to express my appreciation to Dr. Viau for bringing this portrait before the profession. How poor we should be if it were not for the richness of our inheritance, and the names of those who have

gone before us make us feel proud of our profession. It stimulates us to go forward and do the best we can, to carry on the work to a higher plane.

Dr. E. C. Kirk, Philadelphia, Pa.

It seems to me that the finding of this portrait and the bringing before this audience more accurate knowledge of the life work and history of Pierre Fauchard, is an act which we should all appreciate highly and appropriately acknowledge.

I move that this Congress pass a vote of thanks to the author of the paper for the effort he has made to revive in our minds the history of this illustrious man, and to make it a matter of record.

A Superb Series of Clinics.

It would scarcely be possible to extend too much praise to the Clinic Committee for the masterly array of high-class demonstrations, one hundred and thirteen being listed. The management was flawless. There was ample light and space, so that all operators were enabled to work in comfort, and all who cared to do so were given opportunity to see. No greater evidence of the complete success of the clinics need be offered than to say that during their progress the exhibit rooms immediately below were practically abandoned. It is impossible here to give a comprehensive account of these clinics, but a few of the more important, especially those showing new or novel ideas of value, may be mentioned.

Dr. Schrier's Clinic.

Dr. Emil Schrier, of Vienna, who gave to the world that most valuable method of treating root canals, the use of sodium and potassium, during the Congress at Chicago, again offered something both new and important at the St. Louis Congress. He has invented a perfectly constructed device, which, when attached to a dental engine run by an electric motor, does away entirely with the usual rheostat managed with the foot. Dr. Schrier's apparatus enables the operator to start, reverse, or stop the engine by simply pressing a button on the handpiece. It is also so constructed that handpieces may be changed, as when one desires a right-angle in place of the straight handpiece, without disturbing his device. It was considered by all that saw it as a marvel of ingenuity.

Dr. Taggart's Clinics.

Dr. W. H. Taggart, Chicago, exhibited several new methods in connection with porcelain manipulation. Not the least important of these was a series of rotary burnishers for matrix burnishing. It is well known that the ordinary burnishing of gold stiffens it, and not infrequently a matrix may be warped, and, therefore, ruined by the very attempt to make it perfect. With Dr. Taggart's burnishers this is rendered impossible. The ordinary ball burnisher has the ball firmly attached to, and in fact a continuation of the shank. In Dr. Taggart's set the balls, or other shapes, are ingeniously

attached each to a small shank, which in turn is set within a socket in the larger shank of the handle. This enables the ball to revolve during the action of burnishing, and by avoiding the dragging together of the molecules of the metal, permits a thorough compression of the matrix metal without stiffening or warping. After inventing this useful instrument it remained for Dr. Taggart to find a means of manufacturing, a problem of no slight difficulty being presented, to find a method of firmly attaching the shank of the ball to the main shank, and yet permit the ball to revolve. His method of overcoming this obstacle is quite as ingenious as the original invention.

Dr. Taggart also showed a new mode of fusing the Jenkins porcelain without the aid of a furnace, and without strain to the eyes. He has invented an attachment for the oxy-hydrogen blow pipe which places the flame completely under his control. He can so regulate it that it will melt platinum or merely soften wax. In manupulating the Jenkins porcelain he uses a platinum tray as a carrier, and this he holds over the flame of his blow pipe, so regulated as to just fuse this body. By holding it over the flame for a moment, then removing it for observation, then returning it for a higher fusing if need be, he is enabled to reach just exactly the degree of glaze desired and to obtain the nicest color shades imaginable. At no time is the eye strained to the slightest degree.

His method of managing the final adaptation of matrices is also valuable. The matrix having been practically formed he ties a knot in the end of a bit of narrow tape, which is then passed between teeth posterior to the tooth on which he is operating. The tape is then brought forward lingually and passed through the space where the cavity is and then drawn taut against the matrix which is thus firmly held against the margins. The final burnishings is then done by rolling his rotary burnishers against the tape, which compresses the matrix beneath without affording the latter any chance to shift its position.

Dr. Thompson's Clinic.

Dr. Melville Thompson, of Detroit, was announced to demonstrate the making of a "porcelain jacket crown." As the term "jacket crown" has long been used in connection with a method devised by Dr. Land, and as this new method is quite dissimilar, the final crown being composed exclusively of porcelain, it might be well in future to term this a "porcelain hood." Dr. Thompson has kindly furnished the following description of his clinic.

"Case, Miss B—— presenting for a crown an upper left lateral incisor. This tooth was not unlike a supernumerary, very small and conical. The right lateral was nearly normal in size and well formed. Owing to the arrangement of the teeth, large spaces existed between all of the in-

cisors affording ample room for an artistic restoration. A more ideal case was never furnished by any committee, and the efforts of those in charge were greatly appreciated.

"The first step in the preparation of the tooth was to shorten it about one-third. Next, the mesial and distal surfaces were finished flat with a thin carborundum disk forming a distinct shoulder well above the gum line. This shoulder was then continued upon the labial surface by the use of an inverted cone burr establishing the outlines for the union of the porcelain and tooth. Sharp, small carborundum stones were then used in removing the enamel from the labial surface, and in shaping the entire tooth for the adjustment of the facing used for the crown. Inasmuch as the tooth was very small, and there being plenty of room between the upper and lower teeth when the jaws were closed, it was not necessary to establish a shoulder upon the lingual surface, although it is always the proper thing to do where it is possible.

"The facing selected for this case was obtained from the exhibit of the Consolidated Dental Manufacturing Co., on account of the excellent color and quality of this company's products and their stability during the fusing of new porcelain upon their surfaces. This facing was reduced to a veneer by cutting the pins away and grinding out the under surface with knife edge carborundum and bell-shaped corundum stones in such a manner that an absolute fit was secured upon the already prepared tooth. It is always advisable to have the grinding of both tooth and porcelain finished before making the platinum cap.

"The platinum cap being the next thing needed, a piece of S. S. White's inlay platinum was cut in such form that when the ends united a perfect cone was made. This was slipped upon the tooth and burnished into place, being careful to have the metal extend well up over the shoulder and clearly marks its outlines. The point of the cone was then partially removed and the hole closed by burnishing the remaining projection down upon the rounded end of the tooth. Again going over the case and thoroughly burnishing the platinum it was then partially removed in order to loosen the part extending over the shoulder, and then replaced for the adjustment of the facing.

"After uniting the cap and facing with sticky wax the two were removed and held by pliers, so that the wax might be pulled away, and a small quantity of porcelain body added. When thoroughly dried it was placed in the furnace and fused. This made a permanent union between them and afforded an opportunity for a readjustment if found necessary. Upon placing the piece again in position, it was found to be satisfactory and was then removed for the addition of the porcelain, of which a thin

layer was laid over the entire lingual surface of the cap and then placed in the furnace and given its final baking.

"The platinum matrix was then taken out of the interior of the crown with a burr after carefully drawing it away from the edges toward the center with pliers. The crown was then set permanently with Ames's 'Special Inlay Cement.'

"The porcelain used in this work was obtained by grinding to a fine powder diatoric molars (made by the Consolidated Dental Mfg. Co.), which when added to a facing of the same material produces a crown entirely of high grade and high fusing body.

A more elaborate and technical description of these crowns may be found in the *Dental Cosmos* for June and August, 1903, June ITEMS OF INTEREST, 1904, and in the August *American Dental Journal,* 1904."

Other Clinics. No less than eighteen clinicians made gold fillings, fifteen being members of the G. V. Black Club, all of whom made large contours in bicuspids or molars. There was, of course, free exercise of "extension for prevention." The fillings were all superb and there is little doubt these teeth will not suffer from a recurrence of caries. Seven clinicians demonstrated various methods of making gold inlays for large cavities, and convinced those that saw their beautiful results that the gold inlay for posterior teeth will grow in favor as it is better understood.

Fifteen clinicians showed more or less novel modes of work in crowns and bridges. One could not but be impressed with the high degree of skill displayed, and to note favorably the trend against display of gold.

Resolutions Passed. It having been reported to the Congress that Dr. E. A. Bogue was absent because he had been compelled to submit to a serious surgical operation, a message of sympathy was ordered to be sent to him in the name of the Congress. The sympathy of the Congress was also extended to Dr. Pfaff and his family because of their bereavement through the loss of one of their children.

In connection with the war against bogus diploma mills the following resolution was adopted.

Whereas, James H. Worman, Consul General of the United States at Munich, has, for years, in a spirit of complete disinterestedness, and at great personal expense, carried on a successful campaign against bogus dental diplomas, and also made great efforts to secure international comity in regard to reputable dental degrees; and

Whereas, In all this labor he has received the constant sympathy and support of the Government of the United States, therefore,

Resolved, That the Fourth International Dental Congress presents

its thankful acknowledgements to the United States Government, and to Consul General Worman, and expresses the hope that Consul General Worman will not abandon the European field, but will still continue to give the cause of international comity in legitimate degrees his powerful support.

National Association of Dental Examiners.

During the annual meeting of the National Association of Dental Examiners, held in St. Louis just before the Congress, the following report was received from its Committee on Colleges, and was unanimously adopted. If carefully scanned it will be seen to have an important bearing upon the present rather complicated situation in connection with dental education.

Report of Committee on Colleges.

It will be remembered that the relations between the N. A. D. F. and our Association, which had obtained for some time during the past, were left intact at the close of the meeting of this Association at Ashville, last year. It will be unnecessary to more than briefly refer to the things that have transpired in the N. A. D. F. since that meeting. Suffice it to say that that body has been wrestling with itself as to whether it would or even *could* keep faith with the public and with this Association in the carrying out of the requirements of course for graduation which it had definitely set up in 1901, and put into actual operation beginning with the school year, 1903-'04.

It transpires that at least a majority of that Association by official action has seen fit, for reasons they consider paramount, to seriously modify their course requirements for graduation in a way and to a degree that your committee, as well as the profession at large cannot interpret in any other way than as a most deplorable retrogression. It would appear from what has thus occurred, that the N. A. D. F. has clearly demonstrated that no matter in how good faith it entered upon the establishment of the new standard in 1903-'04, it was utterly powerless of its own unaided strength to permanently establish and maintain it.

After a careful earnest canvass of the whole situation by correspondence and interviews with many of the leading dental educators of this country, as well as with many leading and influential practitioners of experience and observation, and also backed by some of the best legal advice procurable, as to what was the duty of this deliberative body, composed as it is of the various state boards, endowed under their various laws with the judicial and discriminative power and duty of establishing and maintaining reasonable dental educational standards and requirements, your committee is fully convinced that the time is ripe for this Association to

declare in no uncertain tones what we hold to be most essential and necessary qualifications of a prospective dental college student in order to enable him to assimilate and appropriate the great fund of scientific knowledge offered him in any of our properly conducted dental schools.

Your committee would, therefore, recommend that this Association establish at once, to go into operation not later than the opening of the school year of 1905-'06, the educational requirement for admission to the dental college course of graduation from an accredited high school or its equivalent, all examination of credentials and equivalents to be placed in the hands of an acceptable appointee of the State Superintendent of Public Instruction where not otherwise provided for by law.

In view of the present disturbed and unsettled conditions existing in dental educational circles, and with a belief in the wisdom of avoiding all unnecessary disturbance of standards at this time, your committee would further recommend that no change be made at this time in the present requirements of this Association of not less than twenty-eight calendar months of college attendance for graduation.

CHARLES C. CHITTENDEN, Chairman,
H. J. BURKHART,
J. A. HALL,
Committee on Colleges of the N. A. D. E.

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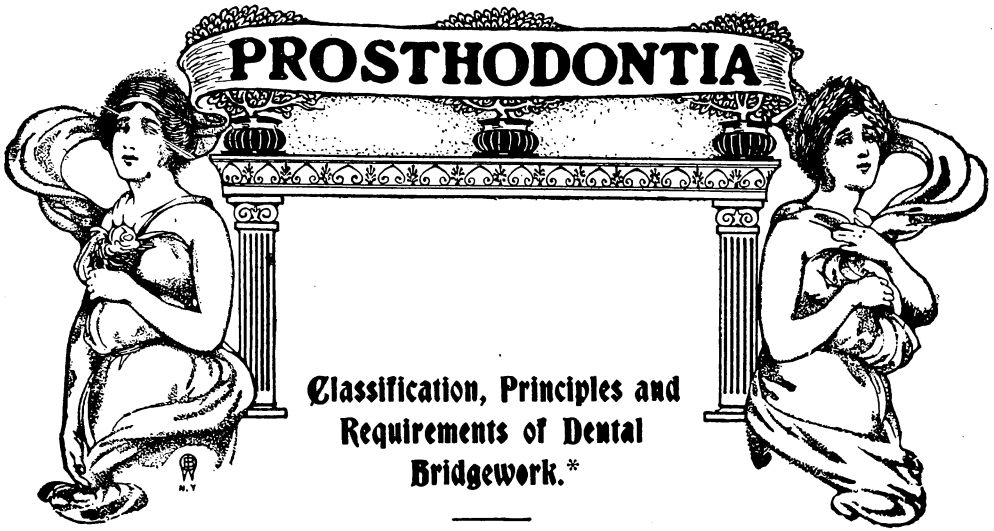

Classification, Principles and Requirements of Dental Bridgework.*

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Advantages and Disadvantages of Bridgework. Principles: Application to Fixed Bridgework. Application to Removable Bridgework. Requirements: Physiological; Abutments, Devitalization of Pulp, Hygienic Considerations; Physio-Chemical Aspect, Mechanical Preparation of Abutments, Adaptation of Attachments, Construction; Contact, Articulation and Occlusion, Assemblage. Esthetic.

Advantages and Disadvantages of Bridgework.

The application of dental bridgework, of either of the two general types of construction which have been designated as "fixed" or "removable" in character, presents phases of advantages and disadvantages which, while being mainly applicable to the *former* class, are nevertheless also more or less applicable to the latter class, though always in a more modified form.

Advantages. The advantages generally claimed may be enumerated as follows:

1. The removal of the many deficiencies associated with the substitution of missing natural teeth by means of the more common forms of plates which depend entirely upon contact for retention.

2. The overcoming of the more or less embarrassing features coincident with the wearing of artificial teeth supplied by such means of retention.

3. The avoidance of any mechanical abrasion of the remaining natural teeth from *clasps,* or *contact of plate,* and the preservation of their integrity, and of the normal condition of the contiguous tissues, thus overcoming any possible tendency to looseness and subsequent loss which may result from such contact.

4. The removal of the impediment to speech, taste, etc., which is usually caused by plates.

5. The more perfect reproduction of masticating surfaces which is afforded by the firmness and immobility derived from a more *fixed* type of construction.

Disadvantages. The disadvantages incident to the substitution of lost teeth by means of bridgework are summarized as follows:

1. The possible necessity for the devitalization of the pulp, and the mutilation of perhaps sound teeth, which must necessarily be employed as abutments.

2. The unnatural condition established by the secure fixation of the roots of two or more teeth.

3. The additional stress to which the abutments are necessarily subjected.

4. The progressive degeneration of the peridental membrane which may thus possibly ensue, cause looseness, and result in subsequent loss of teeth.

5. The unhygienic and consequently unhealthy condition which may be induced by the wearing, particularly, of extensive "fixed" bridges.

An analysis of the possible advantages and disadvantages as thus enumerated would seem to leave some degree of doubt as to the general practicability or impracticability of this class of work. Clinical experience has proven, however, that if the application be judiciously made, and made in accordance with a knowledge and observation of the underlying fundamental principles, and of the physiological and mechanical requirements, the possible unfavorable conditions may be minimized, and the opportunities for obtaining the more favorable ones be correspondingly enhanced.

As these considerations apply to bridgework in general, the particular advantages and disadvantages incident to the judicious application of *each respective type of construction,* and the indications and contra-indications for same, will first be generally considered under the caption of *principles,* and then subsequently further discussed in connection with the presentation of methods of construction.

Principles.

In a previous consideration of this subject, it has been correctly stated that the application of dental bridgework involves "a multitude of devices

which depend upon a few limited mechanical principles"; and yet, however few may be involved, a knowledge of the fundamental principles underlying the application of any mechanical pursuit is always to be considered as a prerequisite to successful achievement, and particularly so when these principles are to be applied to structures attached to the human body.

In the procedure incident to devising and constructing dental bridges, the first and most important considerations presenting are obviously those of the *stability* of the teeth which are to serve as *abutments,* and the *requirements of occlusion,* which, as viewed from a mechanical aspect, are co-incident with the physical considerations of stress and resistance.

Irrespective of the innumerable variety of methods of attachment which are employed, the general principles underlying the application of this work apply, fundamentally at least, to any style of construction, though always with somewhat less force to those which are designed to be "removable" in character than to that style which is intended to become a "fixed" part of the denture.

In either class of construction, in proportion as the stress imposed upon, or to be assumed by, the abutments is diminished, the number of "dummies" which they may be reasonably expected to support of course increases; and, irrespective of the method of anchorage, the degree of stress to which the abutments must be subjected will depend largely upon the number of remaining natural teeth not included in the bridge, and will decrease in proportion to the degree to which the normal occlusal relations may be restored.

Thus the presence or absence of occluding natural teeth will so affect or relieve the abutments as to govern the indications, to a large extent, for each respective type of construction, and to bear materially upon the practicability or impracticability of either.

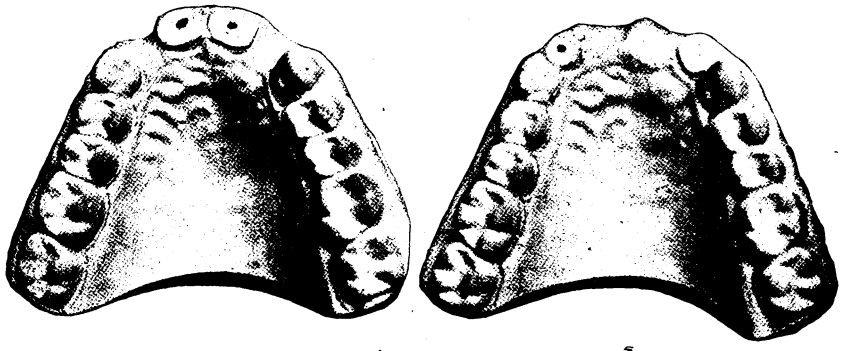
Hence these physical and mechanical considerations demand that the construction of dental bridges be based largely, if not exclusively, upon the conditions and the requirements of each case; and those are usually so diversified in range as to preclude the universal application of any one general line of procedure.

Application to "Fixed" Bridgework.

As related particularly to the application and construction of "fixed" bridges, the root of almost any tooth in the arch is so cushioned and protected by nature as to render it capable of withstanding *vertical* stress to a degree exceeding its own individual requirements; hence it may be generally accepted as a cardinal principle that *one tooth is capable of performing the function of two*—under favorable conditions. Since a similar pro-

tection against *lateral* stress, however, *is not afforded* by the nature of the surrounding tissues, all roots, and particularly those of conical shape, will yield more or less readily whenever in any manner subjected thereto. For this reason the provision, *under favorable conditions,* means much as regards the application of the principle, and the practicability of the work constructed in accordance with it. It means, first of all, that the physiological condition of the tooth, and of its surrounding tissues, must be favorable; and, second, that the *mechanical demands* imposed upon it must be within the limits of its endurance.

An observation of the combined *physical* and *mechanical* requirements thus imposed would demand, first, that the tooth to be so utilized must possess a degree of inherent stability *equal to or greater* than that required of the substitute which it is to support; and, second, that a means



a Fig. 232. *b*

of fortifying it against leverage or rotation on its long axis, or against the possibility of *any lateral* movement, must be provided.

Thus, from a physical view-point, it is apparent that it would not be practicable to expect a lateral incisor to support a central incisor, or a cuspid; nor a second bicuspid to support a first molar, because the natural requirements occasioned by the proportions of the root, or the location in the arch, of the tooth so supported *exceed* those of the abutment or supporting tooth.

Reversing these conditions, however, it would be reasonable to expect a central incisor, or a cuspid, to support a lateral incisor; a first bicuspid to support a cuspid; a second bicuspid to support a first bicuspid, or a first bicuspid to support a second bicuspid, and a first molar to support a second bicuspid, because in these instances the inherent physical stability and natural requirements of the abutment or supporting tooth *exceed* or *equal* those of the tooth which is thus supported. Likewise, a central incisor will support the adjacent central, because in this particular instance the

abutment or supporting tooth possesses a degree of stability *equal* to the requirements of the supported tooth.

This general principle, however, applies only to one end of even the most simple bridges, and, as a rule, its practicability will demand that the other end be adequately protected against the leverage produced by lateral or even vertical stress, as previously mentioned. An exception to this latter requirement, however, as applied to the first molar, may sometimes be made, as this particular tooth, owing to its relative proportions and position in the arch, will usually support a second bicuspid without such a provision.

As pertains to a more extensive application of general principles to typical types of cases, the following may be generally accepted as being

Fig. 233.

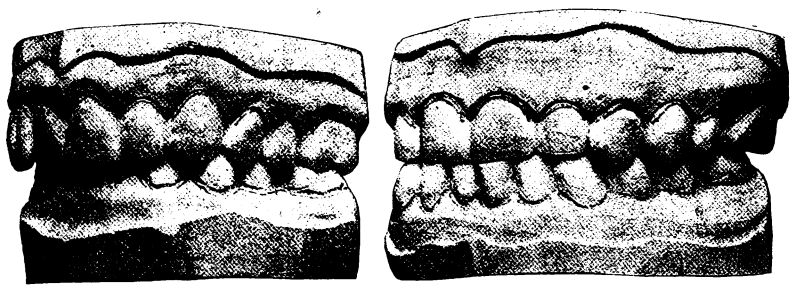
practicable, if it be generally understood and appreciated, first, that by uniting two teeth they act as one, capable of withstanding a minimum stress of two; second, that there can be no movement of the piece independent of the abutments themselves, and, third, that the stability of the piece will depend upon the *strength* and *position* of the abutments, and the security of the attachment to them.

Type A. The two central incisors will support the two lateral incisors, and often if the roots are of good proportion and in reasonably good condition, the two laterals will in turn support the two centrals. (Fig. 232.)

Type B. The two cuspids will usually possess sufficient stability to support the four incisors. (Fig. 233.) This principle is always applicable to the lower arch, but as applied to the upper arch the degree of practicability will depend largely upon the occlusion, and will increase in proportion as the length of the *over-bite* may be shortened. (Fig. 234, A.)

Thus, if the occlusion may be made so as to have the incisal ends of the upper teeth come in *direct contact* with the incisal ends of the lower teeth—which is commonly designated as an "end to end" bite (Fig. 234, B.)—or as nearly so as possible—the degree of *lateral* stress is diminished, and the stress thus becoming more nearly *vertical,* which is in line with the greatest resistance, makes the application more favorable, and precludes the possibility of the cuspids being forced forward, or outward and upward, ultimately producing a separation between them and the first bicuspids.

This displacement will almost invariably result when considerable "over-bite" exists, though the presence or absence of the posterior teeth, and the accuracy of their occlusion, will have a marked bearing upon this tendency to subsequent protrusion, because their presence would naturally relieve the anterior teeth of much stress, which an interrupted occlusion produced by their absence would occasion.



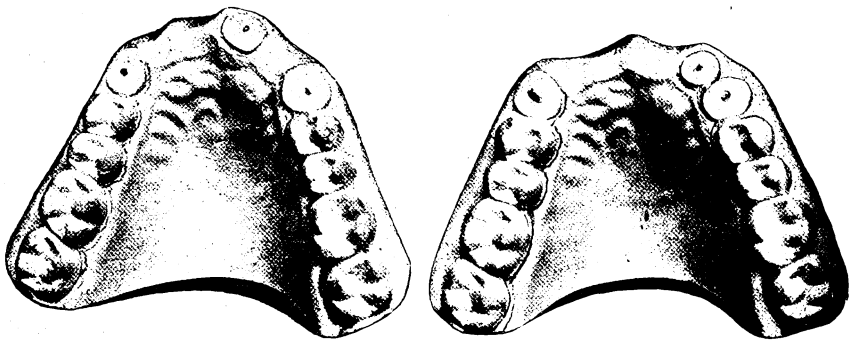
a *Fig. 234.* *b*

Type C. Such a tendency or possibility, in this connection, would practically be entirely overcome by the presence and use of an intervening central or lateral, because of the increased resistance thus afforded. (Fig. 235.)

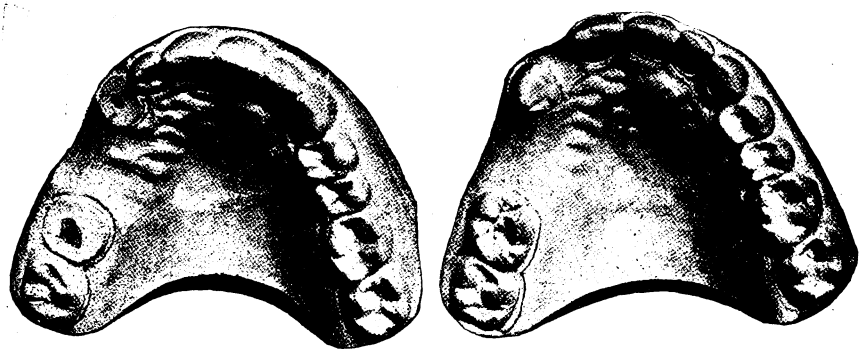
Type D. As a good tooth on each end will always support two intervening teeth in any application, the cuspid and first molar will, of course, support the two bicuspids (Fig. 236, A.), or the two bicuspids and lateral. (Fig. 236, B.) Either one of these applications is typically practical, because of the maximum degree of stability obtained from the employment of these particular teeth as abutments.

Type E. The second bicuspid and second molar will support the first molar and first bicuspid without any additional anchorage anterior to the latter. (Fig. 237,

A.) In this construction, however, it is not usually desirable or necessary to have the first bicuspid "dummy" possess an appreciable occlusal surface, *for the reason that this particular tooth is seldom required to do much masticatory work,* and the strength of the bridge will be increased by throwing the actual work upon the three teeth posterior to it, two of which are abutments.



a Fig. 235. *b*



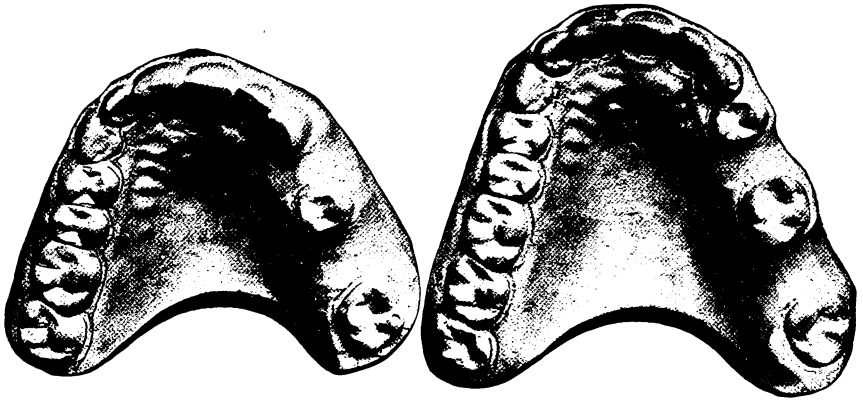
a Fig. 236. *b*

Type F. As a general rule, the first bicuspid and first molar might be expected to support the second bicuspid and second molar, without any additional anchorage at the posterior end. (Fig. 237, B.) In this construction, however, while the presence and use of the third molar may not be necessary, because of the stability of the first molar, still its employment would, of course, add strength to the fixation of the work, and appreciably relieve both of the other abutments. As the third molar and first molar, however, would also support the missing second molar and second bicus-

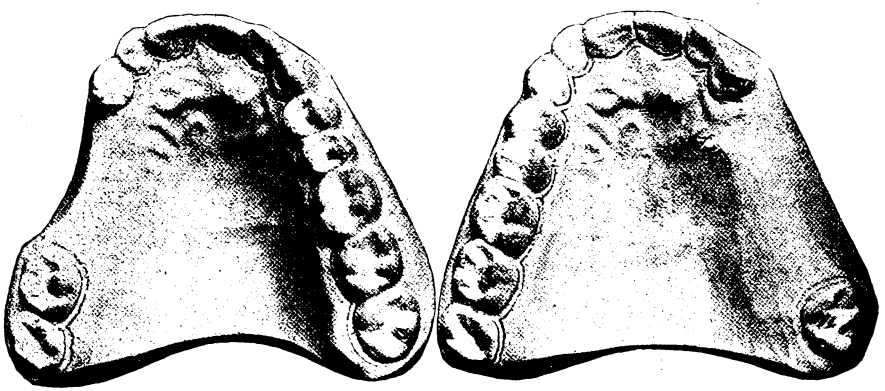
pid, it would always be best to use them, and thus avoid employing the first bicuspid at all.

Type 6.

While the cuspid and second molar will usually support the three intervening teeth (Fig. 238, A.), the same degree of success and permanency offered



a Fig. 237. b



a Fig. 238. b

in this application is not usually to be obtained where the third molar is used as the posterior abutment, and four intervening teeth are supplied. (Fig. 238, B.)

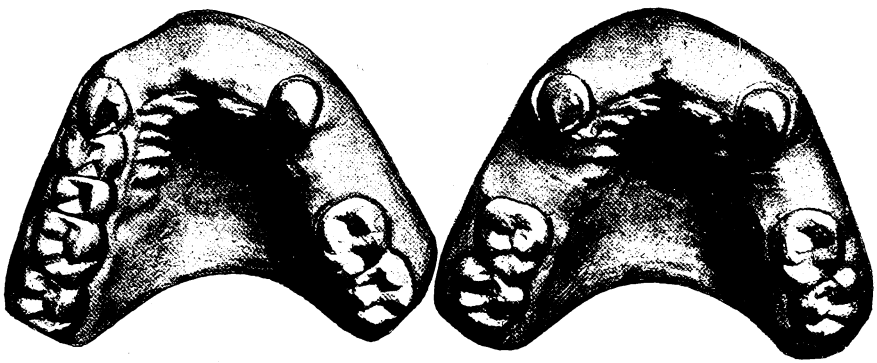
In the event of the forward gravitation of this tooth, however, to an extent which will only require, or admit of, *three* intervening dummies, the employment of the third molar is, of course, more practicable, and increases in proportion to its size and favorable stability.

Type H.

The two cuspids and the first molar on one side will usually support the intervening four incisors and two bicuspids (Fig. 239, A.), and while the three teeth will thus be required to do the work of nine, such a structure is nevertheless practicable if the occlusion and stability of the abutments are favorable.

The two cuspids and two first molars will also usually support the entire denture anterior to the latter teeth (Fig. 239, B.). Where other than the first molars can and must be used, however, the stability of the abutments is lessened, while the requirements are increased, and consequently the degree of practicability is not so great.

Throughout the construction of this work, by far the largest proportion of success will be derived from the use of *small bridges,* and the opportunities for achieving these desirable results will usually be *lessened* as the operation becomes more *extensive,* or as the number of teeth involved increases.



a Fig. 239. b

Supplementary principles which will materially add to the opportunities, and which must always be observed if success is to be attained, are herewith indicated:

1. Do not attempt extensive operations with a view of obtaining more or less permanent results in the mouths of patients under fourteen or fifteen years of age, as the conditions are usually very unfavorable at this time.

2. Do not use loosened and unhealthy roots for abutments, as such conditions only invite failure.

3. Always increase the resistance and lessen any possible chance of failure by utilizing a *maximum* instead of a *minimum* number of abutments.

4. Always make every possible mechanical provision against the influences of *lateral* or antero-posterior stress.

5. Always avoid an interlocking occlusion or an unfavorable *articulation,* which will in any manner interfere with or prevent the free lateral movement of the mandible in the act of mastication.

6. Have the occlusion of the abutments, if anything, more *definite* than that of the "dummies," whenever possible, and provide the latter with as small an occlusal surface as is consistent with the requirements of mastication, thus minimizing the stress to be endured by them.

Application to "Removable" Bridgework.

While these same general principles apply also to "removable" devices, yet the advantages obtained from the support derived from impingement upon the soft tissues, together with the slight degree of mobility which the attachments for this class of work usually afford, imposes less actual stress upon the abutments. Hence, in proportion as the stress imposed upon, or the work required of the abutments is diminished, the number of teeth which they may be reasonably expected to support increases.

The successful application of dental bridgework is based so largely upon the existing physiological conditions as to preclude the adoption of any positive rules which will be absolutely universal in application, but the opportunities for success will increase as the practitioner who essays to do such operations becomes familiar with the fundamental laws of *dynamics,* the science which treats of the principles of force.

Requirements.

As the application of bridgework necessarily embraces a combination of surgical and mechanical procedures, a degree of familiarity with the preceding underlying principles must be further supplemented by a more or less exhaustive knowledge of the closely allied sciences of pathology and therapeutics.

With these attainments as a foundation, a higher appreciation of the actual *requirements* will follow, and while the limitations and apparent simplicity involved would seem to indicate that the application of dental bridges does not usually or necessarily present serious phases, nor extreme difficulties, yet, nevertheless, the operator is often confronted with many interesting and *some* perplexing problems.

In proportion, however, as such fundamental knowledge in the composite may be acquired, the scope of opportunities for attaining successful achievements, and for the solution of difficult problems, will, of course, be enlarged.

A consideration of the actual *requirements* involved in the practical and successful employment of this class of work may be best presented by

classifying them as *physiological, mechanical and cosmetic,* the relative order in which they present, and treating them from the separate viewpoint of each respective class.

Physiological.

The special requirements which may be classified as presenting a physiological aspect include those, of course, which bear materially upon the restoration and preservation of the normal condition of the abutment teeth and contiguous tissues.

Abutments. The placing of the roots of the abutment teeth in a proper, and in the most favorable condition is necessarily the first consideration, from a physiological viewpoint. In this connection, all that has been previously said concerning the physiological and therapeutic aspect of the requirements incident to the preparation of roots for *individual crowns* is applicable with even *greater emphasis* to the treatment of those which are to serve as abutments for bridgework.

Devitalization of Pulp. As applied particularly to the question of the practicability of devitalizing the pulps in those teeth *which are to be crowned,* and which are to further serve as supports for bridges, the previous recommendations should be even more forcibly observed, for the following reasons:

1. Because the application of bridgework of any form should always be made with a view of obtaining the highest possible degree of comfort and permanency.

2. This desirable degree of comfort and permanency will usually obtain and increase in proportion to the manner in which the supporting or abutment teeth may be placed in a condition offering immunity from subsequent pathological disturbances.

3. The application of a piece of bridgework should offer no more opportunity for the action of deleterious influences of any nature than existed before its insertion.

4. Such influences may be induced by the abnormal stimulation of the contents of the tubuli, or of the pulp—as a result of the shock incident to the preparation of the root; or from the increased or diminished thermal action, which irritation may result in a rapid or in a slow destructive process; or in the formation of "pulp nodules"; or ultimate death may ensue from stasis of the blood supply, or from peridental atrophy, as a result of the vise-like fixation of the tooth in its socket.

In any event, an abnormal condition is established, and even more mechanical preparation is required; hence, the most conservative judg-

ment must be exercised, with a view of placing the roots in the most favorable condition possible.

If the tooth is to be entirely encompassed with a "shell or telescope" crown, this will usually demand that the pulp be removed, and that the canals be placed in an aseptic condition and their apices filled with a substance which will act as an impenetrable barrier to the subsequent invasion of pathogenic organisms.

The exceptions of age, as previously noted, however, will guide the operator in the practicability of such a procedure, but with these exceptions, and since the pulp is recognized as being purely a formative organ, the practice under these conditions should be more or less general.

Hygienic Considerations.

The success of this class of work, from the viewpoint of the comfort and health of the patient, will demand that every means for obtaining as hygienic a condition as possible must be observed.

To obtain this, the device must be well adapted to the supporting teeth, and all shoulders and pockets which would invite the accumulation of food products must be avoided. All parts in contact must also be well adapted to the contiguous soft tissues, and any sharp and irregular edges which might cause irritation and hypertrophy, should be removed. Lingual surfaces which will be sufficiently accessible to the bristles of a tooth-brush to admit of being kept reasonably clean must be provided, and as large interproximal spaces as is consistent should exist.

Physio-Chemical Aspect.

As applied particularly to "fixed" bridgework, a physio-chemical aspect presents which makes it necessary that the *mounting medium* should be protected against the action of the secretions, and thus contribute to the hygienic conditions, as well as to the preservation of the supporting teeth, and to the permanency of the operation.

In this connection, also, it is desirable to use as high a karat of gold as permissible—when gold is used at all—throughout the construction of the work, and that all exposed surfaces should be *well finished* and *highly polished* before mounting, in order that the susceptibility to discoloration through chemical action of the secretions of the mouth may be diminished.

Indeed, every precaution against irritation, and against affording opportunity for the action of the products of fermentation should invariably be observed.

Furthermore, when every effort to provide a device which will be as self-cleansing as possible has been made, it is then the duty of the operator to instruct the patient in the proper manner of keeping it scrupulously clean, and to advise him of the necessity for it. If all of these pre-

cautions are properly taken the most objectionable features of "fixed" bridgework will be largely removed, and when they cannot be, such methods of procedure are rarely indicated.

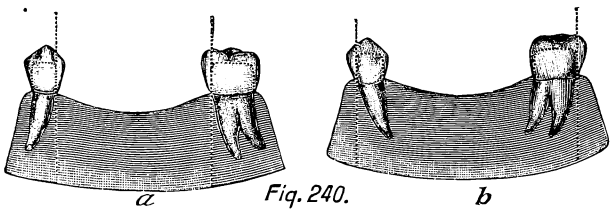
Mechanical.

The requirements which present from a purely *mechanical* aspect are so closely allied with those which have been considered as "physiological" as to be scarcely second in importance, and hence success will of necessity be co-dependent upon an observation of both of these phases of the underlying prerequisites.

Preparation of Abutments.

The first consideration in this particular connection is obviously that pertaining to the mechanical preparation of the abutments.

While the requirements involved demand the paralleling of the remaining walls of the natural teeth, as outlined for individual crowns in Chapter VI., the proper and ready adjustment of the bridge after the respective attachments are rigidly united *also demands* that the axial walls of the abutments must be reduced until presenting *mutually parallel* lines, as illustrated in Fig. 240.



a *Fig. 240.* *b*

From these illustrations, presenting more or less common conditions, it will be observed that a lack of *at least* absolute parallelism between the axes of the projecting ends of those teeth which are to support "telescope" crowns will preclude the subsequent adjustment of the bridge, *if the crowns even approach a close fit* at the neck.

Thus, in reducing the walls of the abutments, in the manner indicated in Chapter VI., this requirement must be observed, and if sufficient accuracy may not be gauged by the eye, exactness may be obtained from actual measurement by the use of a small pair of pointed calipers, by which means it may be definitely ascertained whether the *antero-posterior* dimensions between the *cervix* and *occlusal* ends are the same.

In instances where a "telescope" crown is employed upon one abutment, in combination with a "dowel" crown upon another, and where the axis of the root supporting the latter is not parallel with that of the one supporting the former, as illustrated in Fig. 241, it will be necessary to reduce the *projecting* antero-posterior walls of the root supporting the

"telescope" crown, until they may be made nearly parallel with the root canal which is to receive the dowel, in order that the assembled bridge may go readily to place.

Even then it will usually be necessary to enlarge the orifice of the canal somewhat to admit of *starting* the bridge toward its correct adjustment; and when *two or more "dowel crowns" are employed under similar conditions,* it will be necessary to observe this particular requirement, and then also to allow the dowels to extend into the canals only to a depth which will admit of the proper adjustment, and yet insure at least the minimum of necessary strength in the attachment between crowns and roots.

Adaptation of Attachments.

The adaptation of the attachments to the abutment roots must be sufficiently strong to insure integrity, and preclude subsequent mobility or displacement when subjected to stress, and must also be sufficiently accurate to offer no possible source of mechanical irritation to the soft tissues.

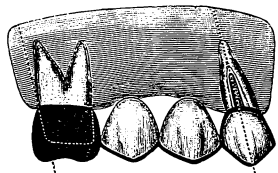


Fig. 241.

Construction.

The requirements of construction demand that the features of *contact* with the contiguous tissues, of *articulation and occlusion,* and of *assemblage* must all be carefully observed.

Contact.

The relation between the various parts of the bridge and the soft tissues must always be of such a nature as to preclude any irritation which may result in subsequent hypertrophy and attending discomfiture.

This will require that *the necks of all facings,* and all surfaces and edges of the metal construction which are to be placed in contact with the tissues must be *nicely rounded* and *perfectly smooth,* and that any *undue pressure* which would be likely to cause superficial or capillary stasis must be avoided.

Articulation and Occlusion.

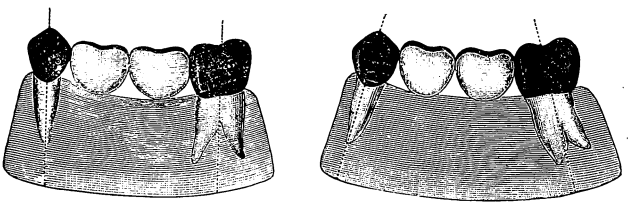
No phase of the construction of bridgework is more important than the requirements of articulation and occlusion.

Bearing upon the requirements in this particular, it has been previously stated that by uniting two or more teeth "the movement of each is

so modified and restrained as to enable them to successfully withstand more force than the sum-total of their individual resistances," but this theorem is usually applicable only to those teeth, the axes of which are in *parallel lines;* and one of the most common errors made in the construction more particularly of "fixed" bridgework is the increased stress which is thrown upon the abutments, without due regard for the resistance afforded.

Hence, in the construction of this work the directions of the least and greatest resistance of each abutment must be noted, and the articulation and occlusion so adjusted as to conform as closely as possible thereto.

In this connection, it must be remembered that the abutments will withstand the required degree of *vertical* stress—if the application of the piece be judicious, but that any tendency toward antero-posterior or lateral movement lessens the permanency of the work.



a *Fig. 242.* *b*

For this reason the occlusion must be so adjusted as to control or at least minimize any movement in these directions; and, as the cusps increase in depth, the stress of articulation becomes more severe, and hence the tendency to displacement or failure is thereby increased.

If the axes of the abutment roots, however, are in parallel lines, as illustrated in Fig. 242, A., any antero-posterior movement either in the direction of greatest or least resistance is, of course, mutual, but if they are not parallel, as shown in Fig. 242, B., when one abutment is subjected to stress in the line of its *greatest* resistance, the other receives it at its *least.*

In properly dealing with these conditions, the occlusion of the abutments and intervening dummies in the *latter* class should be so adjusted as to *relieve* the force of the occlusion on the dummies somewhat, and to throw the greatest stress in the line of the greatest resistance *on each individual abutment,* but each abutment must always receive the forces of mastication, squarely upon its occlusal surface, *bucco-lingually,* in order to avoid lateral tendency.

This may be accomplished only by a *proper formation of the cusps in their relation to the opposing teeth,* and in order to reduce the stress upon the abutments *the cusps of the dummies should always be smaller*

bucco-lingually than those of the crowns, and no larger than the absolute requirements of usefulness will demand.

The proper arrangement and adjustment of the articulation and occlusion of bridgework, in accordance with these requirements, and the usefulness of the work, together with a proper observation of precautions against displacement or accident, are of sufficient importance to demand special and painstaking attention, and the best results will doubtless be afforded by the use of an anatomical articulator, or one which will at least admit of some lateral movement.

Assemblage. When the construction of all of the crowns and dummies constituting the respective parts of the finished bridge has been completed in individual form, and since the piece can possess no greater strength than its weakest point, the assemblage should be made in such manner as to insure *adequate* and *uniform* strength and integrity.

Cosmetic.

The cosmetic requirements incident to the construction of this class of work demand that conspicuous or unnecessary display of gold should be avoided, and that the *individuality* of all teeth which are placed within the range of vision should not be destroyed by arranging them, or their backings, in such close proximity as to leave no interproximal spaces, or no separation between their incisal ends.

The artificial teeth should be selected and arranged in accordance with the requirements of color, size, shape, alignment and characteristics, and if the highest artistic results are to be obtained, it is essentially desirable that the "dummies" within the range of vision should be of the *same length* as the abutment crowns, or adjacent natural teeth.

Whenever occasion indicates the observation of further artistic efforts, resort may be made to tinting with mineral paints or colored "bodies," or to the insertion of small gold fillings, as a means of making every possible effort to have the artificial substitutes in harmony with their environment.

A Study of the Peridental Membrane from the Orthodontist's Standpoint.

By Dr. Frederick B. Noyes.

Read before the American Society of Orthodontists at Buffalo, N. Y., December, 1903

I feel that I owe the Association an apology in presenting the present paper, for it had been hoped that we could report the results of some new studies of the physiologic and pathologic conditions resulting from the movement of the teeth. My other work, however, has been too heavy for me to undertake such a task, and I only offer some facts in regard to the peridental membrane of special interest to the orthodontists which have been gleaned from my previous work on these tissues.

The Peridental Membrane.

The peridental membrane may be defined as the tissue that fills the space between the surface of the tooth and the bony wall of its alveolus, surrounds the root occlusally from the border of the alveolus, and supports the gingivus. I want to emphasize the three things in the definition, for the peridential membrane does not stop at the border of the alveolar process, but continues to clothe the surface of the root as far as the tissues are attached to it, and supports the gingivae, which should overlap the gingival portion of the enamel, and fill the inter-proximal spaces. For this reason especially, the name which has often been used for it "alveolar-dental periosteum," is not suitable, and further, because that term implies

a sort of double membrane, which is a misleading view of that membrane which attaches the teeth.

For convenience of study, the membrane has been divided into three portions: First: The gingival portion surrounding the root occlusally from the border of the alveolar process and supporting the gingivus: Second: The alveolar portion from the border of the process to, or about to, the apex of the root; and third: The apical portion filling the apical space through which the vessels enter the pulp.

The membrane is a continuous covering for the root and the divisions are purely for convenience. In the alveolar portion, there is, of course, no quesetion as to the extent of the membrane: it reaches from the surface of the cementum to the surface of the bone; but in the gingival portion there might be some question as to where the peridental membrane stops, and the fibrous mat of the gum tissue begins. In studying transverse sections, however, in this portion it is seen that there is a rather definite boundary between what would be called peridental membrane, and its union or fusion with the much coarser and irregular mat of the gum tissue. The distance to which the fibres are traced is seen to be considerably greater on the lingual than on the labial side, and there are other differences in the arrangement of the fibres which will be noted later.

The peridental membrane belongs to a very large class of connective tissue membranes, embracing such structures as capsules of glands, tendon sheathes, synovial and articular membranes, and the periosteum which is its nearest relative, many of whose functions and characteristics it possesses. Like most of these membranes it is composed chiefly of white fibrous connective tissue, containing many blood vessels and nerves, but few capillaries.

The differences in these membranes are chiefly in the character and arrangement of the bundles of fibres and their adaptation to the functions which the membrane perform. It is, therefore, perhaps well to begin with the description of the fibres of the peridental membrane and their arrangement, with reference to its functions.

Fibres of the Peridental Membrane.

We describe two kinds of fibres in the membrane: First, the principal fibres which constitute the chief bulk of the membrane and perform its physical function of maintaining the tooth in position. They may be defined as those fibres, which, springing from the surface of the cementum pass across the membrane and are attached at their other extremity to the bone of the alveolar process, the outer layer of the periosteum at the border of the alveolus, the fibrous mat of the gum, the cementium of the approximating tooth or the epithelium of the gingivus; second, the interfibrous or indifferent fibrous tissue which fills the space between the

principal fibres and surrounds and accompanies the blood vessels and nerves; these fibres are much smaller and more delicate in character, and are apparently simply to fill in the spaces.

Functions of the Pericementum.

The membrane performs three functions; physical; the support of the tooth and the surrounding tissue in relation to each other; second, a vital function; the formation of cementum on the surface of the root and bone on the wall of the alveolus, and when occasion demands, the absorption of the root or the process; third, a sensory function. It is the seat of the sense of touch for the tooth.

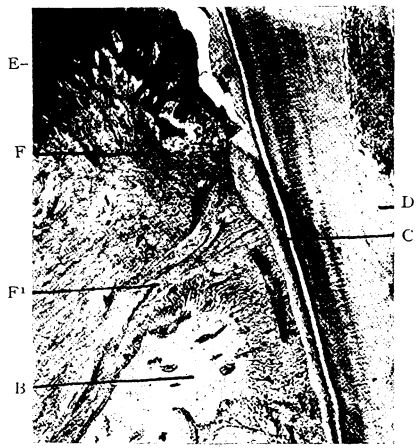


Fig. 1.

Longitudinal section of the peridental membrane in the gingival portion, showing the lingual gingivus. E, epithelium; F, fibres extending into the gingivus; F¹, fibres joining the outer layer of the periosteum; B, bone at the border of the alveolus; C, cementum; D, dentin.

The physical function is performed by the principal fibres and their arrangement is beautifully planned with reference to the forces to which the tooth is subjected. Before describing this arrangement, just a few words in regard to the fibres themselves. They are larger or smaller bundles of fibrils, with all the structural characteristics of the white connective tissue fibres, as found in the tendons and elsewhere. They spring from the cementum as bundles of fibrils, which usually break up into smaller bundles, or fibres, to be re-united into larger bundles where they are built into the bone. The fibrils, or strands of the fibre, are very minute, wavy and do not branch. The cells are found usually of spindle or stellate

form, squeezed in between the bundles of fibrils, and are much more numerous in the young than in the old membrane.

It is hard with any series of sections to illustrate the arrangement of the principal fibres springing from all parts of the root, for this can be made out only by reconstructing them in the imagination after a study of many sections. I am going to ask you to make such a use of your imagination and to picture to yourselves from the illustration the direction and arrangement of the fibres.

Beginning at the gingival line, or the first point where the tissues are

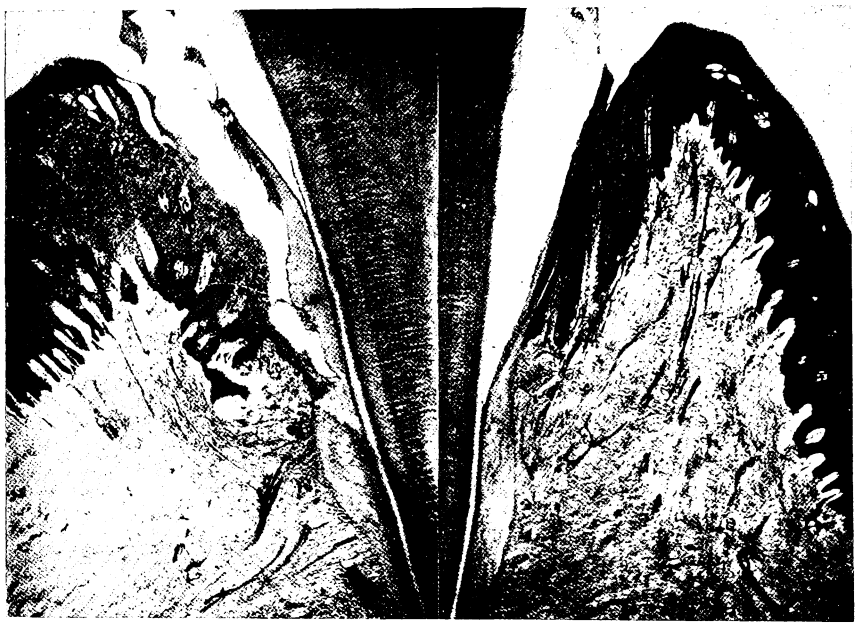


Fig. 2.

Labial and lingual gingivæ from the same tooth, the lingual to the left, the labial to the right.

attached to the surface of the root, Fig. 1, the fibres springing from the cementum bend sharply occlusally, and pass up into the gingivus or free margin of the gum, which overlaps the enamel and fills (normally) the interproximal space. These fibres, as they pass into the gingivus break up into smaller bundles, interlace with circular fibres, which run around the tooth in the gingivus, and are lost, in the fibrous mat which supports the epithelium. Fig. 2. They are much more plainly seen, and are larger and more numerous lingually where, in biting, the food is forced against the low and rounded gingivus. One need only to bite into a hard apple

to demonstrate the force which tends to pound down the gingivus. The circular fibres or circling fibres, together with these, hold the gingivus close against the surface of the tooth and keep it in position. In those cases of gingivitis where we see the gingivæ hanging away from the tooth, as if everted, the circling fibres are relaxed and the connective tissue between the epithelium fingers of the gingivus are inflamed and infiltrated, causing the appearance.

Just a little beyond the first point of attachment to the surface of the

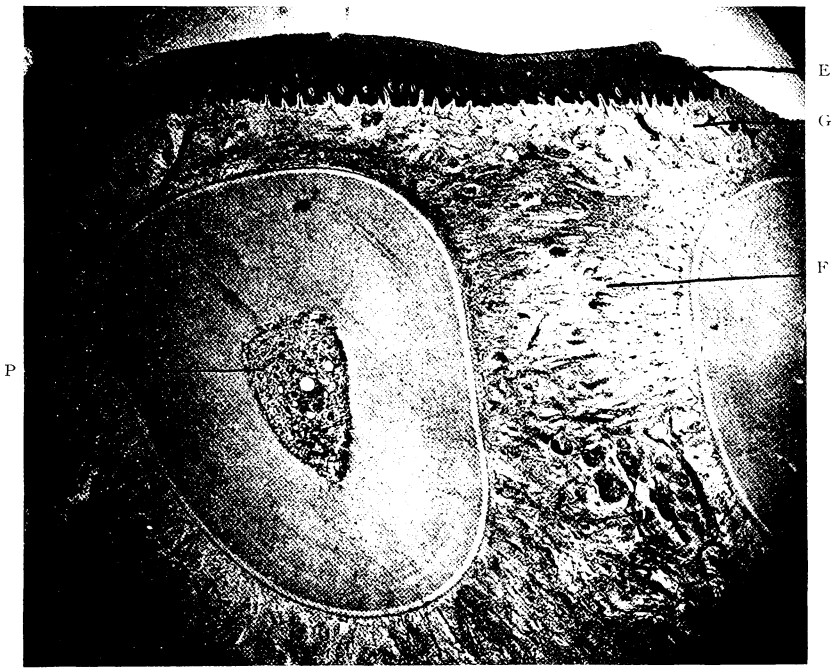


Fig. 3.

Transverse section in gingival portion of the peridental membrane, showing the roots of two incisors. E, epithelium on the labial; G, fibrous mat of the gum; F, fibres extending from tooth to tooth; P, pulp.

tooth, the fibres pass out from the cementum, on the labial and lingual sides, and are attached to or lost in, the fibrous mat of the gum, but the distance to which they retain their identity is characteristic of different positions, and the boundary between peridental membrane and gum tissue, is fairly definitely marked.

In a transverse section in this portion of the membrane, Fig. 3, these fibres can be traced to better advantage. On the labial the gingivus is

comparatively thin, and the fibres are comparatively soon lost in the gum tissue. Toward the mesial and disal angles of the root the fibres swing around laterally, and branching and re-branching, as they go, pass to the

Fig. 4.

Longitudinal section at the border of the process, showing fibres extending from the cementum to the bone. D, dentin; C, cementum; B, bloodvessel; F, fibres of peridental membrane extending from cementum to bone; A, bone of the alveolar process; P, periosteum; G, gum tissue.

next tooth, to be inserted into the cementum covering its root, and all along the proximal surfaces of the root, the fibres springing from the cementum are large, and pass to the cementum of the next tooth, branching and in-

terlacing as they go, and winding around blood vessels and bundles of fibres which are passing up into the gingivus.

The fibres are of great importance; they not only hold the teeth in contact, but they form the foundation of the gingivus, which should fill the interproximal space, and the first symptom which results when they are cut off from the cementum by absorption or violence, is the sagging of the gingivus. It is a commonly known fact that when a tooth begins to move from pyorrhea it moves away from the pocket, that is if the left center has moved distally, a pocket will be found mesially. This is because the fibres have been cut off on the mesial and still being attached on the distal they pull the tooth in that direction.

In cases where central incisors are widely separated it is very difficult to make them keep their normal position, after they have been moved to contract, because the fibres are not continuous from the cementum of one tooth to the cementum of the other, and the normal bond is difficult to produce. It is possible that strictly surgical means might be effective in such cases.

In fitting bands for regulating appliances or crowns, these fibres must not be forgotten, for a band that is too wide, not properly shaped, or which does not fit, will do damage, that is often difficult to repair, and the same damage may be produced by ligatures.

On the lingual side the fibres can usually be traced further before they are lost in the fibrous mat of the gum. Fig. 4. The fibres passing from tooth to tooth or cementum to gum tissue, constitute the greatest number of fibres in the gingival portion of the membrane, but a little further apically, just before the alveolar border is reached, many large fibres are seen, which spring from the cementum and incline apically as they pass away from the root; on the proximal sides these fibres are inserted into the bone of the alveolar border, forming the septum between the alveolus, but on the labial and lingual sides they unite into large bundles, forming a very coarse network, and are attached on the outer layer of the periosteum, covering the labial and lingual surfaces of the bone. These fibres are a very definite and pretty dense layer which has been called the dental ligament. It probably has some function in holding the tooth into the alveolus.

At the border of the process the fibres pass directly from the cementum to the bone at right angles to the axis of the tooth. These fibres are large and in their course do not branch nor interlace as much as in other portions of the membrane, though in some places they spread out somewhat to be inserted into the bone.

The arrangement of the fibres as seen in transverse sections is especially important. Fig. 5. At the central portion of the labial, lingual, and proximal surfaces of the root; the fibres radiate from the surface at right

Fig. 5.

Transverse section in the occlusal third of the alveolar portion of the peridental membrane. M, muscle fibres of the lip; P, periosteum; B, bone of the alveolar process; F, fibres supporting the tooth against rotation; C, cementum.

angles to the surface. But at the angles, the disto-labial, disto-lingual, mesio-labial, and mesio-lingual, they run to the bone almost at a tangent to the surface. And these points often show especially large and strong bundles which spread out considerably in their attachment to the bone. They hold the tooth against the forces which tend to rotate it in the alveolus. The presence of these explain the conditions which exist in rotating teeth. Two sets of tangential fibres are stretched and two are relaxed, but no absorptions are produced and consequently none of the fibres are cut off. And it takes a long time for the fibres to be reformed or adapted to the new position into which the tooth has been forced.

In the occlusal third of the alveolar portion of the membrane the course and character of the fibres is very much as has been described. But in the middle and apical thirds they are inclined more and more occlusally in passing from the cementum to the bone, so swinging the tooth in its socket, supporting it against the force of occlusion. In their course, they are often seen to arise as large bundles and spread out in a fan-like form, to be inserted into a larger area of the alveolar wall, leaving room between the branches close to the bone for the larger blood vessels of the membrane.

In the apical portion the fibres radiate in all directions, and spread out a great deal over the comparatively large area of the bone surrounding the apical space. Reviewing them it is seen that the fibres in the occlusal third of the alveolar portion and the apical portion support the tooth against lateral pressure and rotation, while those in the middle and apical thirds of the alveolar portion swing the tooth against the force of occlusion. Could there be a more perfect adaptation of structure to function?

Construction and Destruction of Alveolar Process.

After having considered somewhat extensively the arrangement of the fibres of the membrane with reference to the physical functions of the peridental membrane, I want to consider somewhat imperfectly the formation and removal of the alveolar processes, which seems to me to be characterized by an apparent wastefulness of activity, nature seeming to build up a tissue for a temporary purpose, only to tear it down and rebuild with a structure better suited to the conditions.

In the development of the jaws, the formation of bone has not been studied carefully and consecutively enough to give us at all a satisfactory knowledge of it, some authorities stating that it is entirely endo-membranous; others that it is partly endo-cartalagenous and partly endo-membranous. Even the centers of formation and manner of development are comparatively imperfectly known. Some authorities state this Meckle's cartilage is entirely absorbed without being transformed into bone; others

that it is at least partly transformed into bone and then absorbed in the process of growth.

But without going into uncertain fields we may safely say the first appearance of bone in the mandible is the formation of spicules or plates of bone in the undifferentiated meso-dermal tissue producing a network of plates with large nutrient spaces. The formation progresses until a supporting and protecting framework is produced in the body of the mandible, then on the surface of the cancellous mass a definite periosteum is gradually produced, which covers the surface of the spongy mass with more or less perfect layers of sub-periosteal bone. The formation of bone spicules appears first in the region of Meckle's cartilage, between the cartilage and developing tooth germs and proceeds in such a way as to surround the cartilage rod, and grow up around the tooth germs on the labial and lingual, first inclosing them in an open trough, later separating them by septae and inclosing them in separate bony crypts. These crypts are bounded by comparatively compact plates with small narrow spaces, but are not strictly a continuous layer of sub-periosteal bone, but have many large openings into the more spongy structure. As soon as the bony frame work of the mandible is covered by a periosteum, the growth proceeds by the formation of subperiosteal bone which is at once destroyed, from the inside and converted into Haversian system bone, with the lammelae arranged concentrically around nutrient canals, which, however, remain large, giving an open and cancellous structure to the tissue.

At birth this is practically the condition of the jaw. Meckle's cartilage has disappeared, whether by absorption, or conversion into bone and then being absorbed.

The changes in the shape of the jaw with the development of the teeth have been described so often that I will refer to them only briefly, and to remind us that the development of the face and the changing expression from the child to the adult is accompanied by the development of the jaws and alveolar processes, and a movement downward and forward of the upper incisors; upward and forward in the lower incisors; the change is in the lower portion of the face, increasing the length of the nose, lips and chin. We may represent a child's face by drawing an oval and placing the eyes in the center vertically while an adult face is represented by an oval with the eyes at the junction of the upper and middle thirds.

We are especially interested in the development of bone which leads to these changes, and this development is associated with the eruption of the teeth, the bone growing up around the roots as the teeth come into position.

As the tooth lies in its crypt at the time of birth it is not attached to the bone by any fibrous attachment, but is surrounded by the fibrous wall of

Fig. 6.

Longitudinal section through the border of the alveolar process, showing manner of formation. B, solid sub-periosteal and sub-peridental bone; A, absorption space; H, B, Haversian system bone rebuilt; C, cementum; P, peridental membrane.

its follicle. The bony covering of the crypts are absorbed and as the crowns move toward the surface of the mucous membrane and emerge from it the roots are developed, and the fibres are built into the cementum on one side and the crypt wall on the other. Just at what point and in what way this is done has not been shown, nor at what stage in eruption the first attachment of fibres to the surface of the root occurs. It seems, however, that there is an attachment of the fibres at the gingival line by the formation of cementum and a building of them into the border of the crypt by a new formation of sub-peridental and sub-periosteal bone. And as the tooth is erupted and the root developed, the border of the crypt is carried occlusally, changing the crypt into the alveolus.

A section through the alveolus of a temporary tooth of a sheep will show this method of growth. Fig. 6. There is first a solid ring of bone formed around the border of the crypt; in other words, osteoblasts between the fibres of the connective tissue form and calcify bone matrix around these fibres and on the bone of the crypt margin. This soon becomes of considerable amount and in section is triangular. The osteoblasts from the medullary spaces below now dissolve out the central part of this ring and it is replaced by Haversian system, or concentric lammelae, so giving the spongy character to the greater mass of the process, while the more solid layers of sub-periosteal bone remain only on the labial and lingual surfaces of the process, the sub-peridental layer with its imbedded fibres lining the alveolus.

When the absorption of the roots of the temporary teeth begin, there is first an appearance of many osteoblasts in the medullary spaces of the cancellous bone over the crypt of the permanent tooth, removing not only the crypt wall, but also the bone of the temporary alveolar process. This cuts off the attachment of some fibres and there is a compensatory formation of new bone at the border of the temporary alveolus to attach some new fibres. At the same time the surface of the root is attacked near the apex and some fibres are cut off, and a considerable scoop made into the dentine but the attack soon stops here, and a slight rebuilding occurs, reattaching the fibres, while a large excavation is made a little farther occlusally; then a rebuilding occurs in the second place and a still greater excavation is made in the first point of attack. This being continued the tooth is finally left with a partial ring of cementum at the enamel border, attaching fibres which are fastened only to the ring of the old alveolus, or the fibrous tissue if that is all gone. The coming permanent tooth has no temporary alveolus to which to be attached, but is attached to the rim of its crypt, which grows upward as the tooth erupts and so forms the new alveolar process.

We cannot emphasize too strongly the fact that the great portion of the bone of the process remains open and cancelous in character, and that the layer of compact sub-peridental bone lining the alveolus and sub-periosteal bone covering the labial and lingual surfaces, remain thin. It is probable that often the absorptions produced by pressure in moving teeth are not so much in the sub-peridental bone lining the alveolus and in the cancellous bone between the plates, and the movement may be thought of as moving the root and the lining of its alveolus bodily through the light cancellous structure. This idea has been impressed upon me in observing the absorption in advance of an erupting permanent tooth. There is pressure by the growth of the germ in its crypt, but the wall of the crypt is not first attacked, and it does not seem to be attacked from the inside at all, but the cancellous bone above is attacked all through it and the crypt wall is moved occlusally, and is dissolved from outside, inward.

If the absorptions produced in moving the teeth were primarily in the peridental membrane and on the wall of the alveolus, I would expect more damage to the roots and consequently to the teeth in extensive movements.

It is probable then that in moving incisors forward the labial plate of bone is carried bodily forward, and in moving them lingually while the thickness of the process is much greater, it is chiefly of cancellous character through which the root is moved easily, the bone being absorbed in front of it.

Discussion of Dr. Noyes's Paper.

Dr. Edward H. Angle, St. Louis, Mo.

I was very much pleased with this paper, which ought to and will awaken the keenest interest in all of those who are not empiricists in the field of orthodontia. The Doctor has considered the tissue with which we deal most, and yet to which we give the least attention in our studies; it is the tissue about which we are most puzzled, for we change the positions of teeth only as we modify this tissue, and we succeed in holding the teeth in their changed positions only as we succeed in establishing harmony of this tissue with the other factors in occlusion.

I have long been a believer in and an admirer of Dr. Noyes, and it is with pleasure I noted among the many wonderful pictures he has given us to-day, two or three that were made by him originally for my book. There are certain things, however, about which I wish he had told us

more. I tell you this tissue is as yet much shrouded in mystery. I have been more puzzled with its behaviour than with any other one thing in orthodontia. Why is it that this tissue acts so differently under similar conditions—never twice alike? Why is it that there is such a difference in the force required to move teeth in patients of the same ages? Why is it that we must retain teeth so much longer in one case than in another of the same kind? Why is it that it requires infinitely longer to retain teeth that have been rotated than those that have been moved from lingual or labial to normal occlusion?

In some rare instances I doubt whether we can retain teeth long enough to prevent their returning to their former positions. If this be true, may it not follow that this tissue never becomes physiologically reorganized? I have retained teeth for three years in one or two instances, and as soon as the retaining devices were removed the teeth moved partially back.

What peculiarity do these fibres resisting rotation, possess over those laterally distributed? Why is it, too, that when we elevate a tooth in its socket, say a first molar, that we cannot keep it there? Why does the peridental membrane pull it back, or do the suspensory fibres have to be entirely reorganized? What are the changes, and what is the probable time necessary for them to regain their full function of suspension?

Finally, I am forced to ask this question. Does this membrane and the alveolar process, after being once fully formed, ever become normal again after tooth movement has been carried on to any great extent? I have had cases that led me to doubt this, as for example, you will remember a case I reported before this society at its last meeting—that of a lady thirty-eight years of age, whose first permanent molars had all been extracted at the age of nine, in accordance with that most ignorant and baneful of all advice given as a preventative of malocclusion by dentists, to trusting parents. Of course the remaining occlusion was ruined, and in order to remedy it, it was necessary to tip into upright position the leaning second molars and bicuspids, thus making space for the insertion of artificial substitutes for the lost teeth. These teeth must have remained in these tipped and abnormal positions for something like twenty-five years, and yet they moved back into their original position with far less resistance than would have been the case had they been moved for the first time. I have had similar experiences in the shifting of teeth used as anchor teeth which had been moved from their correct positions by bad efforts in regulating, years before.

I do not wish to be understood as saying that teeth once moved do not again become of normal firmness, but I am forced to believe that under certain conditions this membrane never does regain its normal tone. If

so, what condition does the membrane take on, and what is the range in limit of these conditions?

These are things we should know, for they vitally concern us as orthodontists.

If suspicion does throw doubt on these points, does it not also teach us a potent lesson—that youth, or the period of their eruption, is the time to conduct the movements of the teeth so, as nearly as possible, to allow nature to develop this membrane and the alveolar process in the positions which they should occupy.

How greatly do we need histologists who are also orthodontists to further carry on the investigation of this membrane.

There is another point which I would like to have Dr. Noyes clear up, for some of my orthodontist friends, and I differ as to some of the physical properties of this membrane. I have taught, and believe, that the fibres of this membrane are not elastic, but absolutely inelastic—just as inelastic as nature can make them. Some of my friends believe they stretch, as they claim is proven by the slight movement possible upon pressure with all teeth. Dr. Noyes has also used the term "stretching" in describing these fibres to-day. Now I believe that this apparent stretching is not due to the elasticity of the fibres, but to the straightening of them when they are put upon tension, the fibres in repose being necessarily crooked and bent, owing to their interblending and crossing in order to pursue the many directions they of necessity take in resisting tooth movement. How could they resist tooth movement and be elastic? I am sure Dr. Noyes can clear up this point for us. And I wish to thank him for giving us one of the most interesting and instructive papers ever brought before this society.

Dr. Noyes. Dr. Angle has expressed my opinion exactly. These fibres are as inelastic as nature can make them, and, perhaps, it is better to say that the fibres are put on a tension, because none of these fibres run perfectly straight. They are more or less wavy and will straighten out, but they do not stretch. The bone is more elastic than these fibres.

Dr. Webster. Will Dr. Noyes explain why a tooth in torsal occlusion can be moved into its normal position if the fibres are not elastic?

Dr. Noyes. There is a tension put on the fibres for a long time.

Dr. Webster. Why should there be so much more difficulty to retain a tooth when rotated if not because of the peculiar attachment of the fibres and their stretching?

Dr. Noyes. They are elastic only as a coiled spring is. It is a natural thing for that fibre to be wavy; as much so as it is for a coiled spring to be in a spiral.

Dr. Webster. Does that not also obtain in moving a tooth into labial or lingual occlusion?

Dr. Noyes. No, because you have a pressure which produces absorption and a rebuilding of the bone.

Dr. Webster. I mean on the side from which the tooth is moved. There must be a stretching of the fibres.

Dr. Noyes. In that case there is either an absorption which cuts off the fibres from their attachment, or else the rim is moved along with it. I do not know which occurs. I have no section showing that. Speaking with Dr. Black about that a few days ago, he told me that he was satisfied that in extensive movements labially or lingually, a considerable cavity is created. Now, the question is are the fibres pulled out of the bone; are they cut off from the bone; or is the bone absorbed?

Dr. Webster. Or would the fibres stretch?

Dr. Noyes. I would risk my reputation that these fibres do do not stretch.

Dr. U. E. Barnes, Cleveland, Ohio. I think we are falling into error on this question of tension and elasticity. Dr. Angle says that piano wire is not elastic; and Dr. Noyes says that these fibres are not elastic. I believe they must be. Piano wire is elastic; very much so. Rubber possesses but little elasticity, although we believe it to be very elastic. Glass is, perhaps, the most elastic substance, although we look upon it as possessing no elasticity at all. Elasticity, as I understand it, is the tendency of a substance to return to its original form after compression or stretching. Why is it not reasonable to suppose that these fibres are so elastic that we cannot pull them out; that that tension stays there. I have noticed in some of my cases in which I have moved the body of the alveolus that the tooth has remained in position, and where the alveolus does not go with the tooth there is a tendency for the tooth to return. I believe that these fibres are elastic.

Dr. S. H. Guilford, Philadelphia. So far as I know Dr. Black was the first one to say that the fibres in peridental membrane were of the white, inelastic, variety. Assuming that he was correct, I included that statement in the last two editions of my work on orthodontia. But I must confess that now I do not believe that to be true. Dr. Black assumed that to be true, but gave

no reason for it. I believe that these fibres are elastic, because if they are not, what produces that tremendous tension which draws a tooth back into its original position?

After the tissues have readjusted themselves, what is it that continues to pull a tooth back into its original position? I cannot see how it can be explained except that it is the elasticity of the tissue that does this.

Dr. N. S. Hoff, Ann Arbor, Mich. I know nothing about these fibres, but I have had some experience in straightening teeth, and I have met some of the difficulties that you encounter. But this question of elasticity never puzzled me very much; I do not care whether the fibres are elastic or not. It is not a matter of very great importance. It is the tissue or organ that is of importance in this connection. I have had a great deal of difficulty in trying to move teeth in which this organ had been subjected to diseased conditions, and as a consequence it resembled scar tissue; it had lost its elasticity. In order to move the tooth much force would have to be used, and when you have succeeded in moving the tooth you must retain it in position for a long time before it will stay. I have destroyed the peridental membrane and have lost the tooth in consequence.

I think we will have to go further than these white fibres. We must look to the structure of this organ and the condition in which we find it. Dr. Angle brought this to my mind very forcibly; that it is the condition of the membrane itself in which we are concerned. Whether or not it is healthy is an important question. You are all inclined very favorably to changing the position of these teeth at an early age, and Dr. Noyes suggested that the best time is when the new bone is forming. Why? Because it is forming in a natural way. Bone will not make cicatricial tissue until it has formed naturally, and, it seems to me, that that is the point you want to study.

I do not want to discourage the work Dr. Noyes is doing, because he is doing well; but we must continue our study of the histology before we can appreciate the pathologic conditions we have to encounter. I wish Dr. Noyes would continue his work and give us the physiology and pathology of this issue, for then we will know more about these matters.

Dr. Noyes. We are getting into misapprehension because of a technical matter. There are two kinds of connective tissues; the white and the elastic. The latter are called elastic because they stretch. The ligamentum nuchae of the ox is composed almost entirely of yellow elastic fibres; so, too, the wall of a blood vessel. The statement by Dr. Black, referred to by Dr. Guilford, was not assumed. It was based on the recognition of two kinds of fibres

in the tissue. White fibres are soluble in pure acids and alkalies; elastic fibres are not soluble in acids or alkalies. A thin section of peridental membrane, if treated with these solutions, will have its white fibres dissolved and the elastic fibres, if present, would be left intact. This is proof positive that these fibres are of the white variety and not of the elastic variety. There are very few fibres of the elastic variety in peridental membrane; the principal fibres are of the white variety.

Dr. Guilford. Dr. Black makes another statement to account for the going back of the tooth. He says that the fibres cross each other diagonally, and that when the tooth is moved they straighten out, and when the tension is relaxed they return to their original position. Is that true?

Dr. Noyes. That is correct; but the discussion has centered itself on the question whether these fibres are elastic or whether they straighten out.

In regard to the change in the position of the teeth after they have been moved, I cannot give the reason for that until I have made more sections of jaws showing the different conditions and changes that are wrought by these movements. Human jaws are very hard to get and that necessarily hinders the work very much. The conditions obtaining in animal jaws are not the same as those obtaining in human jaws. Then, too, there is a great difference in the cell activity of different individuals and that must be considered as a factor in these movements. I certainly will continue my work, and I hope that at some time in the near future I will be able to give you results that will be of assistance to you in your work. I thank you very much for your attention.

SOCIETY PAPERS

A Partial Review of Dental Materia Medica.

By G. B. SQUIRES, Ph.G., D.D.S., Somerville, Mass.

Read before the Boston and Tufts Dental Association.

(Continued from page 682.)*

Formaldehyde (Oxymethylene).

This antiseptic, germicide and deodorizer is still being extensively used.

Practically all boards of health consider formaldehyde gas the best disinfectant we have for the surface disinfection of infected dwellings.

Dr. Wm. G. Bissell, writing in the *Buffalo Medical Journal,* summarizes the use of this gas as a household disinfectant as follows: "1. It is the most satisfactory of the gaseous disinfectants. 2. Its penetrating powers are extremely slight. 3. A certain degree of moisture facilitates its action. 4. It should always be supplemented by a cleansing process."

I think every dentist should have a formaldehyde lamp for generating this gas, and should fumigate his office at least once a week, and with an oven attached he can use it for sterilizing instruments.

Formaldehyde gas is marketed in about 40 per cent aqueous solutions. This diluted to a 2 to 5 per cent. solution is being quite extensively used as a dressing for putrescent pulp-canals. It is especially adapted to the anterior teeth, as it produces no stain. Care should be taken, however, not to force it through the apical foramen, as it is a decided irritant when brought in contact with the soft tissues even in weak solutions. Dr. Wheeler, of New York, speaks very enthusiastically of this remedy in the October *Cosmos,* 1903. The gas is formed by the oxidation of methyl alcohol, generally by passing a current of air saturated with the alcohol over a spiral coil of platinum brought to a high heat.

*September, 1904.

Gelatin. I copy the following from one of Merck's recent publications: "Dr. Zuppinger, of Vienna, uses injections of gelatin in bleeding occurring in hemophiliac children. He gives a case of bleeding following tooth extraction in a girl with severe purpura hemorrhagica. Ordinary styptics had no effect. A hypodermic injection of 10 c.c. of a 5 per cent gelatin solution arrested the hemorrhage in a few minutes.

It is essential that the gelatin be pure and sterile. There is a specially prepared, sterile, 10 per cent solution on the market.

We look upon this as a new use for gelatin, but Dr. Y. Miva, a Japanese physician, tells us that it was used as a hemostatic by the Chinese 1,600 years ago.

Glutol. A compound of formaldehyde and gelatin. A white powder, insoluble in water or alcohol. Used as an antiseptic covering for wounds, sores, etc., applied full strength. Is also used as a local styptic.

Guaiacol. The chief constituent of creosote. Is now synthetically produced from pyro-catechin. Is a colorless, oily liquid, with a characteristic aromatic odor. It is an anti-tubercular, antiseptic and local anodyne. Dr. Marichal, of Havana, considers it equal to cocaine in tooth extraction. He uses a 10 per cent solution in olive oil for infection. It is also recommended as a remedy in pulpitis.

Holocaine. A local synthetic substitute for cocaine. A white crystalline powder, soluble in 50 parts of water. Its solution can be boiled without decomposition. Is used in a 1 per cent solution, mostly in eye diseases. Is considered too toxic for subcutaneous use.

Hydrogen Dioxide. U. S. P. title, Dioxide of Hydrogen Water. Contains 3 per cent by weight of the gas, which equals 10 volumes of available oxygen. Used extensively by the medical and dental profession. All aqueous solutions contain free acid, added to make it more durable. Some claim there is enough present to injure the enamel of the teeth when used in the mouth full strength. With this in mind, I wrote Squibb and received the following: "Our product when freshly made and as put up contains about .02 of 1 per cent of free acid. The amount of acidity, however, frequently increases with time and therefore our product usually shows an actual increasing acidity the older it is. As to the acidity being sufficient to endanger the enamel of the teeth, we much doubt, but a series of definite experiments in that line would surely be in order, and you gentlemen are the ones to give us the results of your investigations."

The free acid can be neutralized by adding bicarbonate of sodium to the solution, but when so treated it should be used soon, as it decomposes and loses its oxygen much more rapidly in an alkaline medium. Dioxide of hydrogen water when heated on a water-bath, not above 140 degrees Fahr., loses chiefly water. Therefore, to obtain it in a concentrated form, we merely evaporate the regular 3 per cent solution. The greater the pressure on the cork, when opened, the greater the loss of oxygen. Oxygen when once liberated from the solution cannot be reunited by agitating the bottle or otherwise. I have seen it recommended, for preserving, to place bottle containing the dioxide in water, stoppered end down. This does not keep it any longer.

Hydronaphthol. A few years ago, during the dental boom in this drug, I wrote a leading New York chemical house in regard to it and received the following reply: "We beg to state that investigations appear to prove that hydronaphthol is simply an impure betanaphthol. In view of this, the statement that its antiseptic action is greater than that of pure betanaphthol is probably an error.

Ichthyol (Ammonium Ichthyol-Sulphonate). Obtained from the dry distillation of a bituminous quartz containing fossil fish remains in great quantities. This rock is found in certain parts of Europe. It is a thick brown liquid, bituminous odor, soluble in water. An antiphlogistic, antiseptic and alterative. Considered by dermatologists as one of the most reliable antiphlogistics. Is used in dentistry in the treatment of pyorrhoea, applied topically in 25 per cent glycerine solution or mixed with lanolin.

Iodoform. Prepared by heating together iodine, potassium bicarbonate and alcohol. It contains 96 per cent of iodine. Squibb says: "It still holds its own very effectively notwithstanding the repeated presentation to the profession of claimed substitutes." Considering that we have reliable substitutes, I think it is seldom necessary for the dentist to use this disagreeable drug about the mouth. Dr. G. E. Crawford, of Iowa, in a paper read before his State Society, expresses about my sentiments on this remedy. He says: "Iodoform is one of the feeblest antiseptics—in fact it must be sterilized itself before it is fit to use at all; and if used freely, is more likely to poison the patient than the microbes. There is no good reason why this 'skunk' of modern surgery should not be banished from respectable society."

Iodyloform. A recent substitute for iodoform. Is a combination of iodine and gelatin, in the form of a yellowish brown powder, odorless and insoluble in water, alcohol or ether. It contains 10 per cent of iodine and is non-toxic.

Lysoform. A combination of lysol and formaldehyde. A thin, soapy product, soluble in water and alcohol. Is recommended as a valuable disinfectant for the hands. Dr. P. Strassman, of Berlin, says a 5 per cent solution is as efficient as a 1 to 1,000 solution of mercury bichloride.

Lysol. A saponified product of coal-tar, chiefly composed of cresols. Is a brown, oily liquid, soluble in water, alcohol and glycerine. Is used as a substitute for carbolic acid in ½ to 2 per cent solutions. The cases of poisoning with this drug appear to be increasing. Dr. Geo. Burgl, of Bavaria, enumerates 18 cases of intoxication on record in the literature of the past year.

Naphthol-Beta. A coal-tar derivative. Made official in the 1890 Pharmacopœia. A powerful antiseptic and bactericide. Considered one of the best intestinal antiseptics known. Used externally, principally by the dermatologists as an antiseptic and parasiticide. I have used it successfully in 25 per cent alcoholic solution as an antiseptic in root canals and to disinfect cavities before filling. Its two principal objections are: 1. Turning dark of the solution. 2. A somewhat disagreeable odor.

Nargol. A new chemical compound of silver and nucleic acid, containing 10 per cent of silver. A light brown powder, soluble in water. Does not coagulate albumen or stain the tissues and is claimed to be more penetrating than silver nitrate. Dr. A. G. Whippern, of Chicago, writing in the *Medical News,* reports "Three Obstinate Cases of Empyema of the Maxillary Antrum" cured with injections of solution of nargol.

Is used in 5 and 10 per cent aqueous solutions.

Narkotil. I quote the following from Merck's Archives: "Narkotil, states Dr. T. Eastham, is an ether obtained by the direct action of hydrochloric acid on the distillate of a mixture of ethyl and methyl alcohol. . . . It occurs as a colorless, exceedingly volatile liquid of a pleasant odor; it is inflammable. . . . Is used for inducing narcosis. . . . Its general action is said to be quite similar to that of ether.

Nervocidin. The active principle of an East Indian plant called *"gasubasu."* Appears as a yellow powder, freely soluble in water.

It is a paralyzing poison, has toxic symptoms and causes irritation. Has been recommended as a local anesthetic, a pulp devitalizer and an obtundent of sensitive dentine. Its anesthetic properties are lasting but weak solutions cause severe inflammation when brought in contact with living tissues.

Theodore Söderberg, D.D.S., of Sydney, N. S. W., recommends it, mixed with cocaine, as an efficient obtundent for sensitive dentine. He cautions, however, against using it in deep-seated cavities. He reports on the use of this remedy in the November, 1901, and August, 1903, *Cosmos*.

Its principal use, from a dental standpoint, will probably be as a pulp devitalizer; and it surely should be tried in those cases where the application of arsenious acid is not feasible. It does not cause sloughing if brought in contact with the gum, and produces no bad symptoms.

Nervanin. The synthetic substitute for cocaine has not received much comment in the medical or dental literature of the past year. It appears in colorless crystals, freely soluble in water. Is claimed to be 10 times less poisonous than cocaine. Has distinct antiseptic properties even in 1 per cent solutions, and can be boiled without decomposition.

Dr. D. H. Ziegler, of Cleveland, O., has experimented quite extensively with this drug. His results are published in October, 1901, *Cosmos*. It is generally used in 2 to 5 per cent solutions.

Oils Essential. Emulsions of some of the volatile oils have been recommended for hand sterilization. According to Merck Calvello has made comparative tests regarding the bactericidal properties of certain oils as compared with a 1/1000 solution of mercuric chloride, and has found that a 7 to 8 per cent emulsion of cinnamon oil or a 10 per cent solution of thyme oil, in washing the hands, has the same sterilizing action as the solution of mercuric chloride, without possessing the disagreeable secondary properties of the latter. The most powerful action is obtained with a 90 per cent emulsion of cinnamon oil, which effects complete sterilization.

Orthoform. A synthetic local anesthetic constituted like cocaine. A white, odorless powder, slowly soluble in water. Used principally as a local anodyne, applied pure or in form of ointment, to painful wounds, burns, etc.

Recommended in certain kinds of toothache and claimed to be especially efficient in those cases of extreme pain following extraction. For the latter use, it is made into a stiff paste with glycerine or olive oil, and packed into the painful socket.

Due to the increasing number of poisoning cases, it is now being used with more caution.

Papain. A vegetable digestive ferment obtained from the unripe fruit of *Carica Papaya* or "Pawpaw." Has been recommended for digesting recently devitalized pulps, i. e., that portion remaining in inaccessible root-canals. It is supe-

rior to pepsin, in that it is active in alkaline, acid or neutral mediums. Is a whitish hygroscopic powder, soluble in water and glycerine.

Paraform (Trioxymethylene). The polymeric form of formaldehyde. Appears as a white powder, insoluble in water, alcohol or ether. Is a powerful antiseptic and an escharotic. It can be prepared by evaporating a 40 per cent solution of formaldehyde. As the water evaporates the paraform gradually precipitates from the solution. It is used in dentistry as a permanent root-canal filling, mixed with other material. Also for treating putrescent pulps and for generating formaldehyde gas.

Pental (Tri-Methyl-Ethylene). Formerly known as amylene. A few years ago this agent was quite a favorite anesthetic for minor operations, but lately many prominent observers have cautioned against its use on account of its being a dangerous cardiac depressant. I think it stands at the head of anesthetics in regard to its mortality, which is 1 in every 162.

Phenacetine. Prepared by the action of glacial acetic acid on paraphenetidin, a body obtained from phenol. A white, tasteless, crystalline powder. Is an antipyretic, antineuralgic and analgesic. The *National Dispensatory* says this drug, "by allaying pain tends to promote sleep and in local inflammation and congestion to diminish swelling." This would seem to especially recommend it for dental use in cases of acute pericementitis leading to alveolar abscess. Phenacetine has slight, if any, toxic properties and rarely excites vomiting, ringing in ears, etc. I have used it with very satisfactory results. Have never had any untoward symptoms and consider it one of the best and safest of the milder anodynes.

Dose, 5 to 10 grains.

Protargol. A silver compound consisting of 8 per cent of silver combined with protein. A yellow powder soluble in water. Is an astringent and bactericide. Has been used successfully in the treatment of empyema of the antrum, in 5 to 10 per cent aqueous solutions, and is recommended as a cure for sensitive dentine due to abrasion. For the latter, I have found it inferior to silver nitrate. It does not, however, stain the dentine.

Pyoktanin (Methyl Violet). The analin dye "pus destroyer." A violet crystalline powder; soluble in 75 parts of water. Is an antiseptic and analgesic. Reported non-poisonous and very diffusible.

Dr. R. E. Graham, writing in the *New York Medical Journal,* says: "As a germicide and antiseptic, pyoktanin stands high in the list. It destroys the vitality of anthrax bacilli in solutions of 1 to 1,000, and retards

the development of pus cocci in solutions of 1 to 2,000,000. Pyoktanin, when applied to an inflamed mucous membrane, stains the same intensely blue; this color remains for a number of days, and of course the pyoktanin is active as an antiseptic as long as any color remains." He says it can be applied to the most delicate mucous membrane, in concentrated solution, with but slight, if any, irritation.

Dr. Darier, of France, has reported several cases of cancerous growths of the face which have responded quickly to a 5 per cent aqueous solution. He appears to consider it a specific in this class of cases.

Dr. Baron von Oefele, of Germany, has used it very successfully in subcutaneous injections for malignant growths, producing rapid reduction of carcinomatous and sarcomatous tissue. Pyoktanin solutions should be kept in dark bottles and not be used when more than 3 days old. The stain produced by this drug can be removed by scrubbing with common soap, followed by alcohol.

Resinol. I quote from Squibb: "Resinol is the name given to a secret proprietary agent recommended for all varieties of cutaneous diseases. On general principles, then, it may not be unexpected for some of the profession to discover unfortunate results, as long as they are kept ignorant of its composition." "Dr. M. L. Heidingsfield, of Cincinnati, O., reports 3 cases of dermatitis traced to the use of this agent. He states that it 'possesses dangerous antiseptic and anodyne properties.'"

Resorcin. A diatomic phenol prepared by fusing sodium benzene disulphonate with caustic soda. Is a white crystalline powder becoming reddish on exposure. Should be kept in dark amber bottles. Soluble in 1 part of either water, alcohol or glycerine. Is an antiseptic and antizymotic. A 1 per cent solution will arrest for a long time putrefactive changes in urine, organic infusions and even animal tissues.

Has been used successfully in aqueous solutions, for different forms of stomatitis. Dr. J. E. Blomfield, of England, reports removing surgically, epithelioma of the lower lip at two different times, the growth reappearing after each operation. After removing the third time, he applied powdered resorcin to the wound. Since then, he states, there has been no recurrence. He further says: "There can be no doubt as to the value of resorcin in rodent ulcers.

Salol (Phenol Salicylate). Prepared by heating salicylic acid with phenol in the presence of phosphorous oxychloride.

A white crystalline powder, insoluble in water. An antiseptic, antirheumatic and antipyretic. When taken internally, on reaching the small intestines, it is broken by the pan-

creatic juice into phenol and salicylic acid. It melts at 109 degrees Fahr., and has been used in this state to fill root-canals. It has been claimed that root-canals when so filled have been subsequently examined and found empty, the salol having split into its component parts. This is possible but not probable.

Septoform. Is described as the condensation product of formaldehyde with members of the terpene, naphthalin and phenol group.

Is recommended as a hand and instrument sterilizer. It does not corrode instruments and when used for washing the hands it softens the skin but does not irritate. It has not the penetrating odor of formaldehyde. Possesses considerable germicidal power. A 3 per cent. solution destroys staphylococus pyogenes aureus in 3 minutes and typhoid bacillus in 10 minutes. Is used in 5 to 10 per cent. solutions for instrument sterilization and in 3 per cent. solutions for wounds. Is marketed in concentrated aqueous solutions.

Sodium Peroxide. Prepared by heating sodium in a current of oxygen. Is a yellowish white powder. When added to water, it is decomposed into sodium hydroxide and oxygen. It yields about 20 per cent of available oxygen. Is used for treating putrescent pulp-canals and for bleaching discolored teeth.

Somnoform. A new anesthetic introduced by Dr. Rolland, of France. Is a mixture of the following:

Ethyl chloride	60	parts.
Methyl chloride	35	"
Ethyl bromide	5	"

Dr. Chaminade, of France, has used it in 100 cases, and states that it is particularly valuable in minor surgery. He claims it is more rapid in action than ethyl chloride. The principal advantages claimed for this mixture are: Instantaneous action, rapid return to consciousness and no bad after effects. It is administered by means of a linen cone interlined with paper to prevent evaporation. Five to 10 c.c. of the mixture are sprayed on cotton, placed in the bottom of the cone, and the nose and mouth is covered to exclude the air. It takes from 15 seconds to 1 minute for anesthesia and lasts from ½ to 5 minutes.

Stypticin (Cotarnine Hydrochlorate). Obtained by oxidizing narcotine, an alkaloid obtained from opium. Is a yellow powder soluble in water and alcohol. A hemostatic and styptic. Recommended in hemorrhage following tooth extraction. Applied pure or in 50 per cent. solution.

The para-phenolsulphonate of anesthesin.

Subcutin. A local anesthetic. Practically the same properties as anesthesin but more soluble. With cold water a 1 per cent solution can be made. A 2½ per cent with hot water.

The solution can be boiled without decomposition, and is claimed to have bactericidal power. The following is recommended for subcutaneous injection:

	Grams.
Subcutin	1.
Sodium chloride	.7
Aqua Dist.	100.

Sublamin. A combination of mercury sulphate and ethylendiamin. Used for disinfecting the operator's hands after washing with soap and water. Said not to irritate. Is marketed in 1 grain red-colored tablets. Three to 6 tablets to a quart of water makes the desired strength.

Sulphonol. Prepared by the oxidation of mercaptol by potassium permanganate.

Colorless crystals, tasteless; almost insoluble in water. Is a hypnotic and sedative. Should be used with care, as there are many cases of poisoning still being reported. Dose, 10 to 20 grains.

Suprarenalin. Supposed to be the same as adrenalin, only made by a different firm.

Tachiol. A name given to silver fluoride and offered as a new antiseptic. Appears as deliquescent crystals which are very soluble in water, the solution turning dark on exposure. Introduced to the profession by Prof. Durante, of Rome. Dr. Perez found by experiments that it was greatly superior to carbolic acid, and only slightly inferior to corrosive sublimate, strength for strength, and the most potent of all the silver salts as an antiseptic. It coagulates albumen only slightly. Used in 1-10 to 1 per cent solutions.

Thiol (Synthetic Ichthyol). Prepared from paraffin oils treated with sulphur at high temperature. Has the some properties and uses as ichthyol and has the advantage in being less irritating and without odor.

Thymol (Thymic Acid). A stearoptene obtained from the volatile oils of thyme. Occurs in large colorless crystals, having an aromatic odor.

Is readily soluble in alcohol but almost insoluble in water. Bartley says: "Thymol is a powerful antiseptic, being 10 times more effective than carbolic acid." I consider it one of the best antiseptics we have and use it extensively for disinfecting deep-seated cavities and as

a root-canal dressing, especially in the anterior teeth. I never permanently fill a root-canal without first swabbing the canal with a 50 per cent alcoholic solution. Then, by drying, the alcohol is evaporated and the thymol deposited upon the walls of the canal, thus making a permanent antiseptic lining.

The two principal objections to its use in surgery are: Its insolubility in water and its property of attracting flies. These do not apply to dentistry, as we can use it for the purposes mentioned above in alcoholic solution or dissolved in oil of thyme; and as for flies, there are not supposed to be any in a dental office.

Trikresol. An antiseptic mixture containing 35 per cent ortho-cresol, 40 per cent meta-cresol and 25 per cent para-cresol.

A colorless, oily liquid, with an odor like creosote; soluble in 40 parts of water. Claimed to be a 3 times stronger germicide than carbolic acid and three times less toxic.

Used locally in ½ to 1% solutions.

Trional. A hypnotic and sedative. White powder, faint, bitter taste. Soluble in 320 parts of water. Is closely allied to sulphonol and considered superior to it, in that it is less toxic, more prompt in its action and produces a more natural sleep. It should not be given for any great length of time, however, as cumulative toxic symptoms are liable to appear. Dose 10 to 15 grains.

Tropacocaine, sometimes called Tropsin. Found with cocaine and other alkaloids in the small Java coca leaves.

Is now made synthetically.

The hydrochlorate is generally used and appears in colorless crystals, soluble in water, which solution can be boiled without decomposition. Claimed to be only half as toxic as cocaine and that anesthesia sets in more rapidly and lasts longer. Also causes much less peremia.

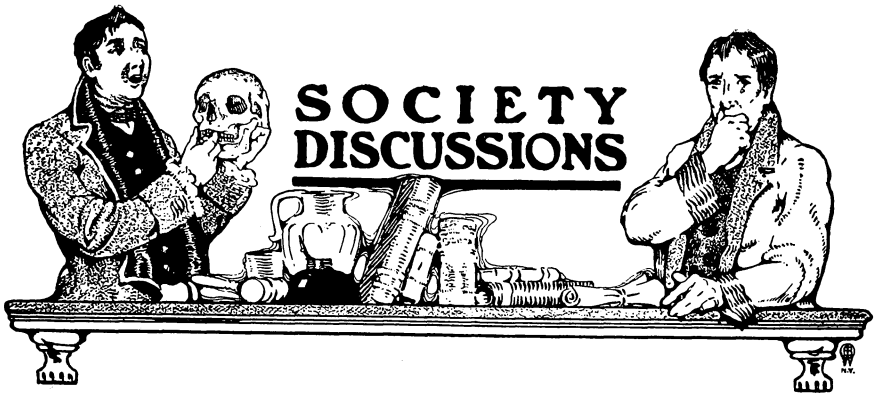
The cost has a tendency to restrict its use, it being 4 times more expensive than cocaine. Generally used in 3 per cent solutions with 0.6 per cent sodium. chloride.

Vioform. A substitute for iodoform. Is odorless and claimed to have non-toxic properties.

Xeroform (Tribromphenol-Bismuth). A substitute for iodoform.

A yellowish green, almost odorless and tasteless powder. There has been no literature of importance on these two agents during the past year.

If there are any questions, I should be very glad to have you ask them, even if I cannot answer them. Thank you very much for you attention.



Boston and Tufts Dental Alumni Association.

February Meeting.

A regular meeting of the Boston and Tufts Dental Alumni Association was held on Wednesday evening, February 10, at the Copley Square Hotel with the president, Dr. John Forbes, in the chair. After dinner the following paper was read and discussed::

The President. I will now introduce to you Dr. G. B. Squires, who will read a paper entitled "A Partial Review of Dental Materia Medica."

Dr. Squires. Mr. President, Ladies and Gentlemen: I wish to say just a word at the beginning. My paper is merely a review of some of the newer remedies—not the new remedies—what I mean by "newer-remedies" are those in use for from two to six yars. I have touched very lightly upon the new remedies, because they have practically no clinical data of any importance. I also touch on some of the older remedies. A review must necessarily be a rehash of what has already appeared in print; for this reason I do not think there will be many things new in this paper to most of you, but perhaps to some of the newer members of this association there may be something that will be suggestive.

The Doctor then read his paper.

The President. Before proceeding with any of the questions I will call upon Dr. Wheatley to discuss the paper, as the hour is getting late. I have the pleasure of introducing Dr. Wheatley, Professor of Materia Medica of Tufts College.

Dr. Wheatley. Mr. President, and Members of the Alumni Association: The lateness of the hour and the thoroughness with which the subject has been covered, perhaps will be excuse for my not taking much of

your time. I am very glad to come here and meet the Alumini Association, particularly as matters connected with my own appointment in the School would be discussed. I accepted the position I hold with a good deal of diffidence, realizing that there were some reasons why the attempt to teach my views to dental students might not be successful. The policy of the institution has been, however, to consider the dental student, as far as my department is concerned at least, in the same light as the medical student—as a man who needs a broad culture and an extended view of matters—and I believe there is good reason why we should ask him to learn things connected with this department that might not from his standpoint have a direct bearing upon his professional work. The same holds true of other departments in the school. The dental student is asked to learn a great deal about the functions and structure of the body, which from the utilitarian standpoint might seem useless, but we have reached that stage in the educational world, where we feel that limiting a man's education to the details of what he is actually going to do in his office is a narrow kind of education.

In this connection I want to say that there is a certain amount of what has been aptly called therapeutic nihilism running rampant in the community, which I believe to be entirely wrong. The theory has been, and to a certain extent is, that the routine use of drugs of any kind is a sort of relic of barbarism, and that the real thing to do in the dental profession, as far as therapeutics are concerned, is to let them alone. In other words, that treatment with drugs is practically of no use. I presume that most of you read some of Mr. Dooley's effusions. He brings out that point when he compares the trained medical man with the Christian Scientist. He says that "if the Christian Scientist had a little more science and the trained medical man had a little more Christianity, it would make little difference which you called, if you had a good nurse." Now, he explains the attitude of a good many communities in regard to the use of drugs.

I am glad to listen to this paper, because it shows on the part of the author very thorough study of the subject, and your attention to it shows that there are some uses for drugs, some things that we can do with them, and that it is a pretty hard thing to get along wihout them.

As I said, when I accepted the position I hold in the Dental School I did it with a great deal of diffidence, feeling that to meet dental students and attempt to interest them in a course as extensive as that laid down for the Medical School would be difficult. I am very glad to testify to the very marked interest and attention that I receive from the dental students. As I said before tonight, in talking with one of the gentlemen here, the dental men whom I meet seem to me to be as much in-

terested in my particular subject as the medical men, and they excel them in many instances.

I want to take this occasion to thank both the dental students, the members of this Association and the members of the Dental Faculty for the kindly way my efforts in the School have been received.

Acetanilid.

The first agent that was discussed was acetanilid, as you may remember. I have been in the habit of treating acetanilid, antifebrin and phenacetin together, considering them all from the same standpoint. Their physiological action and their application run in such parallel lines that I have felt as Dooley does about Christian Science and medical training—it makes little difference which you use. This drug has never shown bad results in my hands. I know that there are reports of poisoning from its use, and one case was cited here tonight. It seems to me rather an unusual case. It was stated that the patient took a couple of doses and died after a few days. That seems to me queer. If he withstood the shock as long as that, I am almost compelled to the conclusion that there must have been other factors in the case causing death.

As to the other two drugs, antifebrin and phenacetin, they are both more expensive than acetanilid. I feel that acetanilid is a fairly good representative of the three.

I quite agree with the author in what he says of acid carbolic. It seems strange that there should be such a profusion of names applied to this common thing. I hope with him that this state of things will be simplified.

Trichloracetic Acid.

As to acid-trichloracetic, I had never given it much attention till I was asked by the State Board of Examiners to meet them and discuss with them the subjects to be taken up in the examinations. Among the questions I noted one upon acid trichlor. and I thought if the State Board was going to ask about it, I should teach my students something of it. I think I should hardly compare its use with that of adrenalin chloride.

Adrenalin.

I want to say in regard to adrenalin chloride that I have met with the most brilliant results in attempting to control hemorrhage with it. It has been very satisfactory in my hands. As far as I have observed, it has been nearly always successful. I only remember one case where I did not get satisfactory results. That was a case where after extraction of a tooth, I attempted to control hemorrhage with cotton soaked with this agent, with different results. I got a very brilliant result by using what is commonly known as toothache gum. The patient

was a stranger, a traveling man. The gum bleeding was quite free, and the use of adrenalin seemed to accomplish nothing. I sent over to the druggist across the street and got some toothache gum, and he had no more trouble.

I understood the author to discuss what are generally understood as recent additions or new remedies, and I am very glad to understand that among dentists alcohol is a recent addition.

Ammonol and Antikamnia.

I want to say in regard to ammonol, and I would also say the same of antikamnia and other allied products, it seems to me that the attitude of medical and dental men in regard to prescriptions of this kind should be that we refuse to prescribe an agent that is put out under a trade-mark name. I have both medical and dental friends who persist in saying that antikamnia and ammonol have given them better results than anything they can get in the same line. From what is known of antikamnia, any power it has must rest in the acetanilid it contains. I am at a loss to explain the popularity of these agents, unless it be that popularity that always comes from judicious advertising. I think the true position of the professional man should be to let severely alone agents of this kind.

Aristol.

Aristol I have used quite extensively and agree with the author that it is a valuable agent as a substitute for iodoform. I do not agree, however, that iodoform is not a somewhat valuable agent. We all know that it is disagreeable to use because of the odor and so we are inclined to let it alone, but I severely question the statement that it is not antiseptic, and that it needs sterilizing before using.

Calcium Chloride. Chloretone.

The author, in speaking of calcium chloride, said that some comment was made in regard to it in the *Medical Brief*. I do not know how dental men look upon the *Medical Brief*, but medical men consider it as an advertisement, and do not consider the opinions in its columns as of any value at all. It is a paper that discountenances the most brilliant advances in medicine; for instance, the use of antitoxin in treating diphtheria. I should look upon any comment in the columns of that paper as practically valueless.

I want to say in regard to chloretone, that my own experience has been a very happy one so far as this drug is concerned. I have found it a valuable hypnotic.

Cocaine.

In regard to cocaine, after a considerable amount of time spent in looking up testimony in regard to a substitute for cocaine, I am of the opinion that cocaine is the most valuable local anesthetic we have. I am not sure but

my ideas of this subject need correcting, but I am very sure that I have talked with several of the leading dentists of Boston in regard to this matter, and the weight of opinion is in favor of cocaine. I want to say further in regard to the use of cocaine, that many of the bad results reported are due to the method of administration. No one here needs to be reminded that the injection of cocaine is a strictly surgical procedure; that all the technique of the surgeon should be observed, and if the dose be not excessive I should be very incredulous in regard to dangerous results. Surgeons use it for extensive operations. They use more than any dentist would use about the mouth, and they get no bad results. Cases that I have been called to treat after the use of cocaine have really been caused by infection from dirty syringes or from lack of proper technique.

Creolin. We have in the market practically the same thing as creolin, under other names, which is much less costly. This, I understand, is a German drug which commands a high price. I have come to look upon creolin and like preparations as valuable antiseptics.

I agree with the author in what he says of creosote.

Codein. In regard to the use of codein and other drugs for morphine, I have come to believe that there is no more danger of encouraging the morphine habit by the use of morphine, than of causing the codein habit by the use of codein. Codein is simply another alkaloid of opium. If we attempted to use codein as we use morphine we would probably find that our patients would become codein fiends. It is always well in writing a prescription to notify the druggist whether you wish it repeated or not. The words "repetatur" or "non-repetatur" should be added. If you do not see your patient, and he keeps running to the drug store, you do not get your fee.

As to ethyl bromide and those other preparations that are spoken of as general anesthetics, I have not the confidence in them which the author appears to have. Ethyl chloride for local anesthesia is of value, but for general anesthesia, ether is the main standby.

I listened to a very interesting paper last summer in regard to disinfecting agents, in which the author spoke of the solutions of formaldehyde. His paper was based upon actual experiments on different germs. His statement was that formaldehyde in solution was not a powerful disinfectant.

Disinfectants. I wish to call attention to the enormous expense which we entail upon our patients by ordering some of the much advertised disinfectants. I had occasion to make an examination of the cost to the consumers of some of these

preparations. The same disinfection can be secured with one cent's worth of corrosive sublimate as with four hundred and ninety-five cents worth of listerine. Listerine is used very extensively. We can afford to consider our patients' pocketbooks when they are buying medicine, if we do not consider them when we are sending our bills.

Ichthyol is one of those agents which has attained considerable notoriety, and has a pretty strong hold on the medical profession. I can safely indorse what the author of the paper says in regard to that.

I was glad to hear him speak of resinol. I think the criticism was just. I was reminded of a patient who reported to a friend of mine. The patient had been suffering from granulated eyelids and the attending physician had ordered the use of yellow mercurial ointment. He got a letter shortly from the patient. The letter read as follows: "My Dear Doctor— I have used your yellow ointment. I am not troubled with granulated eyelids. In fact, I have no eyelids at all."

Salol is a compound of salicylic acid and phenol. As far as I know, the opinion of the medical profession is that it offers no advantages over its constituents used separately. I do not know of any good reason why salol should be considered of any special value.

Papain is one of those agents that I think deserves all that was said of it.

I notice in conclusion that the paper includes a pretty large list of drugs, which shows that dentists are interested in almost every class of drugs that medical men are. I am very glad to listen to the paper for that reason.

Dr. H. H. Piper. I want to call the attention of the members to the fact that we expect a very interesting meeting in April. Dr. Brigham and another of our members— and I think we have no reason to blush for our members after the meeting tonight—will speak. Dr. Brigham will talk on "Porcelain Inlays." Dr. Loutropp has also something to give us on this subject. The programme will be introduced by Dr. Paine, of Commonwealth avenue. I anticipate quite a treat from Dr. Paine.

I want to say just a word in regard to the paper we have listened to. It is something a little new to have anything at once so scientific, so exhaustive and so reliable. I should like a copy of the paper in my office to turn to now and then. I could not begin to take notes on it. There are a great many valuable and interesting things which I should like to get into my memory. It is a paper that we should be proud of. I feel like suggesting that Dr. Squires keep up his notes on Materia Medica that we may all enjoy another paper from him by and by.

Dr. J. L. Bellefleur, Salem.

I fully agree with Dr. Wheatley that in almost all cases where trouble arises from the injection of cocaine it is because dirty instruments are used, for, although the dose of cocaine is often given as one-eighth of a grain, I habitually inject from one-quarter to one-half of a grain and I have never seen any alarming symptoms. I use, however, a sterilizer in which I burn formalin and the syringe with which I inject cocaine, when not in use, is kept in the sterilizer, and so is the spatula which I use in weighing the cocaine crystals. This sterilizer is large enough to contain the glasses which are used to rinse the mouth and the face-piece which we use in administering niotrous oxid. As patients who apply to a dentist for the administration of nitrous oxid are sometimes tainted with throat, lung and blood diseases, and as these patients exhale into this face-piece one after another, I feel that we should be impressed with the importance of thorough disinfection. I do not use these quantities of cocaine at random, however, nor without good authority, knowing that if it causes anesthesia of the nerve terminals, it may also produce anemia of the great nerve centers. I find from *L'Odontologie*, a dental review published in France, that much larger doses of cocaine are employed there than here, but they take precautions that are unheard of in this country; for instance some dentists and surgeons there will not allow a patient to depart without first partaking of either drink or food, when cocaine has been exhibited, but in this country we seem to be too busy to feed our patients. It has been claimed that eucaine B is superior to cocaine because pure cocaine solutions cannot be kept long without deteriorating, but we need not trouble ourselves about that if we prepare the solution fresh for each operation, as we should do. I put enough distilled water into a test-tube to fill the syringe, and into that the cocaine crystals, and then warm them over an alcohol lamp, being careful not to allow the water to boil. Before injecting I swab the gums well with an antiseptic. Today I broke an upper bicuspid and was obliged to lance the gums and work hard to extract the roots, but the first words that the patient said were, "Well, the gums must have been well numbed for I did not feel any pain."

I have had no success with adrenalin chloride. I wrote to Messrs. Parke, Davis & Co. about it, followed their directions, and used it pure, but it has been just like so much water. I have tried it so many times that about one-quarter of the contents of the bottle is gone but I have not had a successful case with it yet.

As to ammonol, I consider it better than acetanilid alone, because it contains ammonium carbonate, which is a heart stimulant. I believe it wrong, however, for us either to use or to encourage the use of these

secret preparations; it being better to prescribe ourselves the ingredients of which they are composed. The formula for ammonol can be found in the *Dental Cosmos* for June, 1897.

I do not use ethyl chlorid as a general anesthetic because it does not seem to have been sufficiently tested yet. A death under its administration is reported in the current (February, 1904), number of the *Dental Cosmos.* Still, Dr. G. Mahé reports in *L'Ondontologie* a case where 30 c.c. were administered to a patient. It, of course, produced great shock in the patient and she had to be taken home in a conveyance, but the next day she had quite recovered. The administration of such a large quantity of ethyl chlorid was not intentional; the tube having an opening at each end, one, a capillary opening, to be used in administering the anesthetic, and the other, much larger, to refill the tube. Inadvertently, the tube was opened at the wrong end and this large amount was used.

Regarding the use of morphine in alleviating pain when all else fails, it has its place; but being fearful of spreading its vicious use, I never allow the patient to know what is prescribed. I leave a prescription with a druggist and give it a distinguishing mark, and all I give the patient is this special mark, for instance, "Prescription P," and on the original prescription left with the apothecary I write "Not to be renewed."

Dr. Jas. R. Piper. Cocaine.

I would like to say a few words about cocaine, which I believe to be one of the most valuable additions to a dentist's medicine outfit. My experience with this alkaloid dates back to the time when it first came into this country, having used various strengths from the crystals to a fraction of one per cent. It was first experimented with on animals, after which a 20 per cent. solution cocaine hydrochlorate was adopted as an injection for local anesthesia about the mouth. This solution was used until tropacocaine came into use. In the hands of the experimenter, tropacocaine proved to be less toxic than cocaine, and just as effectual. To prove this for myself another course of experiments was carried on, this time at the Harvard Medical School under Dr. Chadbourne. This proved to us that tropacocaine was less toxic, but the final results were about the same as from cocaine. Various minor surgical operations were performed painlessly. I remember meeting a physician, who said he was about to remove an epithelioma from a man's face. The patient to be operated upon having heart complications it was unwise to administer ether. I suggested tropacocaine. An appointment was made and the growth was removed painlessly without the alarming symptoms so often reported from the use of cocaine. Tropacocaine I then used but soon fell back to cocaine 4 per cent. solution, believing that if properly used there is no substitute for it.

Acetanilid.

In regard to the acetanilid and the drugs under that head let me say that we, as dentists, ought to be very careful in regard to giving them for the reason we do not see our patients often enough. A physician calls upon his patients as often as necessary, carefully observing the symptoms from time to time, thus noting what effect his medicines may have on a particular patient, and can increase or decrease his doses as the case demands. It was my duty to relieve the sufferings of an interne in one of our hospitals. He was on duty constantly on the surgical side, and it was impossible for him to get away long enough to visit my office. I told him to take a combination of acetanilid, bicarbonate of soda, and carbonate of ammonia. Inside of two days he took 129 grains, taking 10 to 15 grains at a dose every two hours. When he came into the office—he was a big strapping fellow—he looked badly, and I said, "What have you been doing for yourself?" He said, "Taking your medicine according to instructions." And he told me how much he had taken. I said, "Don't you know any better than to take as much as that?" He said it didn't have any effect on him except to relieve the pain, thus allowing him to do his work. He took no more after that, and the abscess I was treating came to a head and was lanced. For another patient I prescribed 5 grains to be repeated in half an hour by 5 more grains, with the understanding that if any serious results arose to stop. She came in the next day and said, "Doctor, I didn't take but 5 grains because I felt queer, but no pain." It seems to me that many like experiences go to prove that we should be very careful for whom we prescribe those drugs and the doses given.

Enzymol.

Enzymol was spoken of. I have used that since it first came out. With me it proved to be more satisfactory than peroxide of hydrogen. It is not destructive. If I have a badly suppurating surface I usually use H O first and then enzymol, first using peroxide, then stopping, keeping up the enzymol. It does the work much better than peroxide of hydrogen. I suggested the use of enzymol to two physicians and they are using it with good results.

Formaldehyde.

I am sorry that Dr. Squires did not say more about formaldehyde. I have had very good results from it. Had occasion to extract two pulps and the patient could tell you that those pulps were removed absolutely painlessly with a combination of cocaine, formaldehyde and adrendalin. I do not know of anything else that can do the work like this combination. With it I can open up a live pulp absolutely painlessly and with me no other medicine or combination of medicines will do it so quickly. I have done it several times and it works admirably. You will probably say that you can

do the same thing with cocaine alone. I don't know whether you can or not. I have used cocaine alone without the formaldehyde for removing pulps. I can do it, but it takes longer. Dr. Ainsworth at one of our meetings said that he used a preparation of cotton, and some one else said that they used soft rubber. I have tried both, that is, the cotton and the rubber, and find that the rubber works better than the cotton, for the reason that the rubber follows in and the cotton does not.

Aristol.

Aristol I value very highly. Several years ago I had occasion to treat an eruption on the lower part of the leg. It proved to be a septic sore. I said, here is a chance to try some of the antiseptic powders. Nearly all of the powders were tried, but none proved so satisfactory as aristol. It is less irritating than the others. Since then I have constantly used it. You very often have a tooth that aches, and resists all treatment. If you will fill that pulp chamber with aristol—dry aristol—then put gutta percha on top of it at the end of six months the tooth can be filled as you ordinarily do in such cases.

Dr. N. A. DeWitt.

I use cocaine as follows: I first get a bleeding exposure and then lay a crystal of cocaine directly upon the pulp and then apply pressure by the use of a small piece of unvulcanized rubber. I place a pledget of cotton over the rubber, which will prevent the instrument sticking and give a better pressure.

Speaking of ammonol, I have not used it to any extent, nor have I used antikamnia, but I have used a prescription which, I think, was handed down to us from Dr. Eames, which is as follows: Acetanilid, 8 grains; sodium bicarbonate, 4 grains, and ammonium carbonate, 4 grains; the above divided into two powders to be taken every two hours. It is very useful in controlling pains from forming abscesses and the like. Once in a while it has failed to give the relief expected, but I think it better than either ammonol or antikamnia, and it certainly is more ethical to be able to prescribe than to advocate the use of patent remedies.

Dr. Baker.

I want to indorse what was said about sterilizing the mouth piece in administering gas. I wonder how the mouth-pieces are sterilized in the dental parlors, where they go from one patient to another. One person may have tuberculosis, another la grippe or worse—they breathe into the mouth piece for five minutes or so and another person comes along and he breathes into it. If the mouth-piece is not cleaned and sterilized after using there is great danger of inoculation. It is well to have the importance of sterilizing the mouth-piece in mind.

A Member. About the use of sulfonal. I had an occasion to use that in my own family recently. One of the members was without sleep for 48 hours. Twelve grains of sulfonal brought a very natural sleep, from which the patient awoke after eight hours. She was forty-eight hours without sleep at all previously.

About arresting a hemorrhage after extraction Dr. Wetherbee used to advise us to plug the cavity with a wedge of cotton, dipped first into a drop of creosote and then dipped into a drop of nitric acid and immediately pressed into the alveolus whence tooth was extracted. This acts both mechanically and as a styptic. I had occasion to use that once in a case where a patient had been bleeding continually from a molar extraction for forty-eight hours. I made the application and three days after I saw the patient and he told me the hemorrhage had stopped instantly and never recurred. This mixture of creosote and nitric acid produces picric acid, a powerful styptic, and I think there are very few drugs that will equal it.

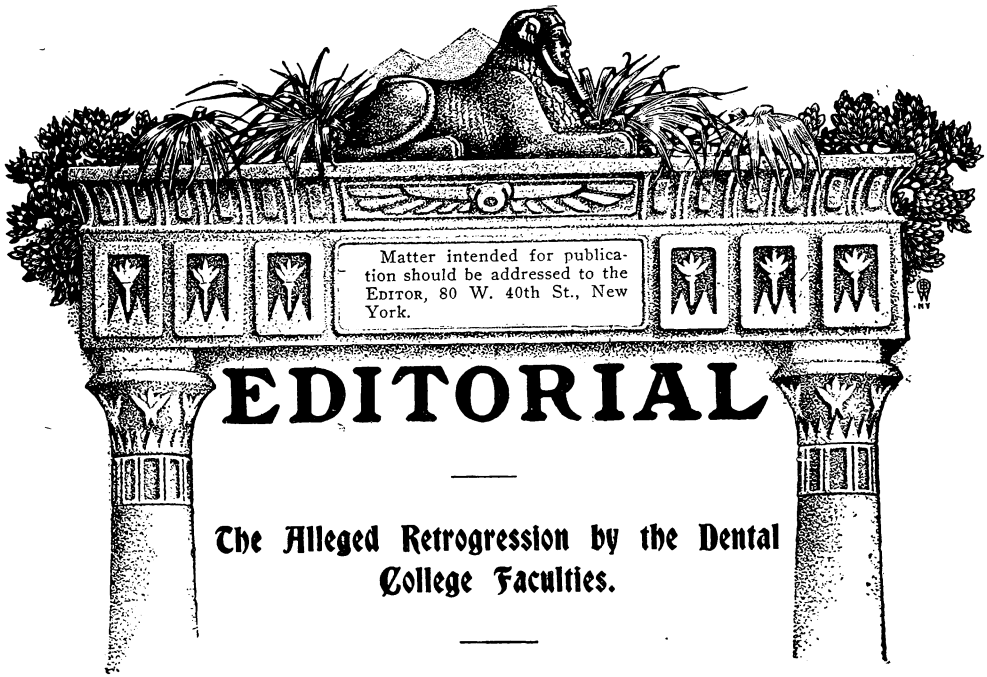
Speaking of protargol not staining the teeth and being a match for nitrate of silver, I read recently of a method of using silver nitrate for sterilizing the teeth and arresting decay. Although it stains the tooth very black, if the teeth are rubbed with a little tincture of iodine the stain is at once removed. There (indicating) is a tooth that I experimented with. The whole tooth I painted with silver nitrate (about 25 per cent. solution); at first it did not stain it; after a few days it was as black as ink. Then today I ran iodine over it and you see it is very white.

On deciduous teeth I arrest decay by using the nitrate of silver, and if it is a fronth tooth use the iodine and by chemical action it takes away the stain and makes it perfectly white.

Speaking of thymol being a disinfectant. I have been in the habit of making a saturated solution of thymol in chloroform and then dissolving gutta percha in it for filling root canals, and so get the permanent effects of the thymol in the root.

The President. If there is nothing further to be said on the subject I will call upon the essayist to close the discussion.

Dr. Squires. I have nothing special to say except to thank you and to thank the professor for the compliment he has given me in his discussion of the article. As to trichloracetic acid, in this particular case you just apply a very small amount. I cautioned about using it over an extended area. I would not use it in the mouth as I use adrenalin chloride. In regard to cocaine, it seems to me that if we have a substitute like eucaine, which we know to be less toxic and practically as effectual, it is our duty to use it.



Matter intended for publication should be addressed to the EDITOR, 80 W. 40th St., New York.

EDITORIAL

The Alleged Retrogression by the Dental College Faculties.

At a meeting of the Faculties Association held in St. Louis during July, a new rule was adopted in regard to the length of the teaching terms. During the International Dental Congress a great deal of hysterical condemnation of the Faculties was heard because of this "retrogression." It was freely stated that it was a disgrace to American dentistry, for the schools to change from "A four year course of study, to a three year course." Will these gentlemen object if we ask them bluntly, "Why?" And will these immoderate talkers also tell us how it happens to be the concern of the general practitioner who is not connected with any school, whether a dental college takes two or ten years to educate a student? If we reason to a logical deduction, is not this matter of time, exclusively the affair of the contracting parties, the college and the student?

Time! Time! Time! Always Time, as though the length of a term were a true measure of the quality of the education imparted. Is it not conceivable, nay is it not a fact that there are at present existing, schools which teach more in one month than some other schools teach in a full term?

A four-year course, reduced to a three-year course! That is the accusation. The accusers talk glibly of "years," as though a college term covered a twelvemonth. The editor of the *Dental Cosmos,* in his August issue explains that under the so-called "four-year" course the full actual teaching time amounted to twenty-two months, while under the rule adopted at St. Louis, though only occupying "three years," the actual teaching time is twenty-one months. The loss of a month's teaching will seem of small consequence to the average student, in comparison with the year gained. It is probable that no dental graduate ever found himself really competent until he had had at least one full year of actual practice, on his own resources. Compare then the products of the two systems four years after matriculation. One student will have had twenty-two months of college training and lectures for his four years of time, while the other will have had twenty-one months of college training and lectures, plus a full twelve months of actual practice. The first man on commencement day will literally be at his commencement, while the other will already have the foundation of his practice established.

It is not here intended to argue for any lowering of standards, but rather to point out the fallacy of supposing that length of study is a measure of an education. True, four years of high school afford more education than three years of high school. But it is not necessarily true that a four year course in a dental college would produce a better dentist than a three year course, especially if there be but one month's difference in actual attendance.

Of course there must be a minimum time requisite for teaching dentistry, but it would seem that none but those actually engaged in the work of dental education are competent to determine what this minimum time should be. Certainly the average general practitioner is not able to fairly judge; nor is it any of his business.

The general practitioner, however, does have the right to require that those who enter the practice of dentistry, in association and in competition with himself, should at least have definite skill and attainments. In other words, while having no right to criticise the college methods, he does have a right to scrutinize the college product. Moreover, he has seen fit to safeguard his rights, by legislation establishing licensing boards. What then of the boards?

Rights and Duties of Examining Board.

Examining Boards were primarily established for but a single purpose; to inquire into the qualifications of candidates for license to practice dentistry. In other words the definite duty of the examining board is to measure the product of the schools, and to license such only as measure up to the required standard. With the methods of the schools or the durations of their terms they have, or should have no concern.

Yet immediately after the announcement by the Faculties that they will graduate men after twenty-one months of actual teaching, the Examiners Association issues its pronunciamento that graduates must have had "twenty-eight calendar months of college attendance." This is one of those vague rules for which this Association is becoming famous. Does this mean twenty-eight months inclusive or exclusive of holidays and examinations? If the latter, then the Examiners require just seven months more than do the Faculties. The point at issue is that, as with the general practitioner, so with the examining boards. It is none of their business. They have a right to state how much, and not how long a college must teach a student, to render him elligible as an applicant for a license.

SOCIETY ANNOUNCEMENTS

State Society Meetings.

Delaware State Dental Society, Oct. 5, 1904.

Illinois State Dental Society, Moline, May 9, 10, 11, 1905.

Montana State Dental Society, Butte, Feb. 20, 21, 1905.

Northeastern Dental Association, Hartford, Conn., Oct. 19, 20, 21, 1904.

Northern Indiana Dental Society, Huntington, Ind., Oct. 18-19, 1904.

Southern California Dental Society, San Diego, Cal., Oct. 24, 25, 26, 1904.

Wisconsin State Dental Society, Oshkosh, July, 1905.

Northern Indiana Dental Society.

The sixteenth annual meeting of the Northern Indiana Dental Society will be held Oct. 18, and 19 at Huntington, Indiana.

It is expected that we will have the largest attendance of any meeting ever held in this section of the country, and you cannot afford to miss hearing such essayists as Drs. G. V. Black, Hart J. Goslee, F. E. Roach, George E. Hunt, Wm. T. Reeves, E. X. Jones, J. Q. Byram, G. E. Johnson, F. R. Henshaw, F. M. Bozer, Lavina M. McCollum, C. G. Keehn, and many others that have consented to appear on the programme, besides a very attractive list of clinics demonstrating all of the newest and most valuable things in practice.

All the leading manufacturers have signified their intention of making an exhibit of their prducts.

Every up-to-date dentist will be present. Are you coming?

Special social features for Tuesday evening.

Remember the date. OTTO U. KING, Secy.

Northeastern Dental Association.

The tenth annual meeting of the Northeastern Dental Association, will be held in Hartford, Conn., Oct. 19, 20 and 21, 1904. Prominent members of the profession have promised essays and clinics. The exhibits also will be a prominent feature. Remember the dates.

EDGAR O. KINSMAN, Secy.

Cambridge, Mass.

Delaware State Dental Society.

The next regular meeting of the Delaware State Dental Society will be held Oct. 5, 1904.

R. H. JONES, Secy.

Wilmington, Del.

National Capital Dental Society.

A new society has been formed in the city of Washington, D. C., which will be known as the National Capital Dental Society. This society is incorporated under the laws of the District of Columbia, and had its charter made perpetual. The membership starts with nineteen and several applications to be acted upon at the next meeting. It has procured the use of a hall for its permanent home in the central portion of the city, and has every promise of success in its undertaking. The society adopted the Code of Ethics of the National Dental Association and incorporated the same in its constitution and by-laws. The officers are: Dr. James A. Hunter, president; Dr. William B. Daly, vice-president; Dr. Starr Parsons, recording secretary; Dr. J. K. Halley, corresponding secretary; Dr. Jesse B. Schafhirt, treasurer; Dr. Chester Beatty, librarian.

1320 N. Y. Ave., Washington, D. C. J. K. HALLEY, Cor. Sec'y.

Southern California Dental Association.

The next annual meeting of the Southern California Dental Association will be held Oct. 24, 25 and 26 at Hotel Del Coronado, San Diego, Cal. This session will be largely attended as many important and interesting features will be presented to the society.

Los Angeles, Cal. C. M. BENBROOK, Secy.

Central Dental Association.

Will you come to the C. D. A. day clinic banquet and evening meeting to be held at James De Jiannes, 17 Central avenue, near Broad, Newark, N. J., Monday, October 17, 1904? Clinic from 10:30 a. m. to 5 p. m. Banquet at 7 p. m. Essay by Joseph Head, M.D., D.D.S., of Philadelphia, Pa., "Overcoming Shadow Problems in Porcelain Prosthesis."

Day clinics, commencing at 10:30 a. m. Joseph Head, M.D., D.D.S., "High Fusing Porcelain;" practical chair clinic, "Overcoming Shadow Problems."

W. A. Capon, D.D.S., of Philadelphia, Pa., practical chair clinic, "High Fusing Porcelain;" difficult incisor work.

W. C. Herbert, D.D.S., Detroit, Mich., "Table Clinic High Fusing Porcelain;" restoring the entire natural enamel of a tooth with porcelain.

C. B. Stone, D.D.S., of Philadelphia, Pa., "Table Clinic," artistic carving and baking of poreclain inlays.

R. Ottolengui, M.D.S., of New York, "Practical Demonstration of the Meyer Pressure Syringe for Inducing Tooth Anaesthesia."

Arthur A. Jenkins, Esq., of Berlin, Germany, "Table Clinic for Low Fusing," "Jenkins body" and others.

The center of interest in the great International Dental Congress at St. Louis, where over two hundred clinicians were operating at once, was in the porcelain inlay work, and the Committee on Clinics in charge, Dr S. C. G. Watkins, chairman, have made strenuous efforts to give the members of the C. D. A. an opportunity of witnessing the demonstrations of the best inlay workers in the country.

This is the first effort of the C. D. A. in its twenty-four years of history in offering a day clinic. The light and room is admirably adapted, and we ask each and every member to mark off the day of October 17, and be present and avail himself of the grand opportunity.

New Jersey State Board of Registration and Examination in Dentistry.

The New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the theoretical branches in the assembly room of the state house at Trenton, N. J., on October 18, 19 and 20, 1904.

The practical prosthetic work will be done in the office of Dr. A. F. Irwin, 425 Cooper street, Camden, N. J., on a date assigned by him, and the practical operative work will be done in the office of Dr. C. S. Stockton, 7 Central avenue, on a date assigned by the secretary.

All applications must be in the hands of the secretary by the 15th of October.

CHARLES A. MEEKER, D.D.S.

29 Fulton street, Newark, N. J.

Third and Fourth District Dental Societies of the State of New York.

The fall meeting of the above societies will be held at the "New Van Rensselaer," Troy, N. Y., Oct. 18, 1904. Dr. Edward H. Angle of St. Louis, will give an illustrated lecture on "Some Things That Should be Better Known by Both Teachers and Practitioners of Orthodontia." The committee is arranging an attractive programme and extend a cordial invitation to the profession to be present.

CHARLES E. ALLEN, Albany, N. Y.
E. B. RHINEHART, Schenectady, N. Y.

Fifth District Society of the State of New York, Jefferson County Dental Society.

A union meeting of the Fifth District and the Jefferson County Dental Societies will be held at Watertown, N. Y., November 14 and 15, 1904. An attractive programme is being arranged. Dr. E. C. Kirk, of Philadelphia, will be in attendance. Dentists of northern and central New York are invited to be present.

E. E. HARRINGTON, Secy.

Jefferson County Dental Society.

Missouri State Board of Dental Examiners.

The next meeting of the State Board of Dental Examiners for the State of Missouri will be held in the Metropole Hotel, St. Joseph, beginning at nine o'clock Tuesday morning, Oct. 11th.

S. C. A. RUBEY, Secy.

Massachusetts Board of Registration in Dentistry.

A meeting of the Massachusetts Board of Registration in Dentistry for the exmination of candidates will be held in Boston, Mass., Oct. 26, 27 and 28, 1904. All applications together with the fee of twenty dollars, must be filed with the Secretary of the Board on or before Oct. 19, as no application for this meeting will be received after that date. Application blanks may be obtained from the secretary.

G. E. MITCHELL, D.D.S., Secy.

25 Merrimack street, Haverhill, Mass.

Illinois State Board of Dental Examiners.

The regular annual meeting of the Illinois State Board of Dental Examiners, to examine applicants for license to practice dentistry in this State, will be held in Chicago, Oct. 13, 14, 15, 1904. Under an opinion of the Attorney-General the following are eligible to take the examination before the board: "Any one holding a medical diploma from a reputable medical college; any one who has been a legal practitioner of dentistry for ten years prior to moving into the State, and any one who failed to register in this State at the time the law went into effect, which was in 1881." Candidates must furnish their own patients, and come provided with the necessary instruments, rubber-dam and gold to perform practical operations and such other work as is deemed advisable by the board. Those desiring to take the examination should matriculate with the secretary at least ten days before the date of meeting. The examination fee is $10. Any further information can be obtained by addressing the secretary.

J. G. REID, Secy.

1204 Trude Building, Chicago, Ill.

Maryland State Board of Dental Examiners.

The Maryland State Board of Dental Examiners will meet for examination of candidates for certificates on Nev. 8 and 9 at the Dental Department of the University of Maryland, corner Green and Lombard streets, Baltimore, commencing at 9 a. m. Application blanks and all information will be forwarded by the secretary.

F. F. DREW, Secy.

701 N. Howard street, Baltimore, Md.

New Hampshire Board of Registration in Dentistry.

The next meeting of the New Hampshire Board of Registration in Dentistry will be held at New City Hall, Manchester, N. H., Dec. 13, 14, 15, 1904, for examination of candidates for registration. Candidates should come prepared with *all instruments* and *materials* to put in both gold and amalgam fillings. So far as possible, patients will be furnished by the board.

A. J. SAWYER, D.D.S., Secy.

Manchester, N. H.

Ohio Board of Dental Examiners.

The regular semi-annual meeting of the Ohio Board of Dental Examiners will be held in Columbus, Nov. 29, 30 and Dec. 1, at Hartman Hotel.

Applications for examination should be filed with the secretary by Nov. 19th. For further information address,

H. C. BROWN, Secy.

185 East State street, Columbus, O.

Red River Valley Dental Society.

At a meeting of the dentists of the Red River Valley, held at Crookston, March 21st, the Red River Valley Dental Society was organized, with a charter membership of twenty-four and the following officers elected: President, Dr. W. A. Robertson, Crookston, Minn.; Vice-President, Dr. J. E. Argue, Red Lake Falls, Minn.; Secretary, Dr. J. F. Boles, Crookston, Minn.; Treasurer, Dr. S. Rowan, Willsboro, N. D.

Board of Directors—Dr. Fiset, Grand Forks, N. D.; Dr. Lanning, Thief River Falls, Minn.; Dr. Penney, Stephen, Minn.

Membership Committee—Dr. H. E. Jackning, Fertile, Minn.; Dr. A. J. Bell, Minto, N. D.; Dr. D. L. Stanton, Cass Lake, Minn.

The next meeting will be held at Grand Forks the first Monday of July.

J. F. BOLES, Sec'y.

Crookston, Minn.

Vermont State Dental Society.

At the twenty-eighth annual meeting of the Vermont State Dental Society, held at Montpelier, March 16-18, 1904, the following officers were elected for the ensuing year: President, Dr. H. Burbridge, Woodstock; First Vice-President, Dr. George F. Barber, Brattleboro; Second Vice-President, Dr. George O. Mitchell, St. Albans; Secretary, Dr. Thomas Mound, Rutland; Corresponding Secretary, Dr. Grace L. Bosworth, Rutland; Treasurer, Dr. W. H. Munsell, Wells River; Executive Committee, Dr. J. Churchill Hindes, Vergennes; Dr. C. H. Kent, Barre; Dr. Harry F. Hamilton, Newport; State Prosecutor, Dr. J. A. Robinson, Morrisville.

Dr. Henry McManus, of Hartford, Conn., and Dr. John F. Dowsley, of Boston, Mass., were elected honorary members of the society.

The next meeting will be held in Rutland, the third Wednesday in March, 1905.

Rutland, Vt. THOMAS MOUND, Secretary.

Iowa State Dental Society.

The forty-second annual meeting of the Iowa State Dental Society was held at Des Moines, May 3, 4 and 5. The following officers were elected for the ensuing year: President, Dr. J. V. Conzett, Dubuque; vice-president, Dr. J. B. Pherrin, Central City; secretary, Dr. C. W. Brunner, Toledo; treasurer, Dr. Mae Reynard, Osceola.

Toledo, Iowa. C. W. BRUNNER, Sec'y.

Wisconsin State Dental Society.

At the thirty-fourth annual meeting of the Wisconsin State Dental Society held at Manitowoc, July 19-21, 1904, the following officers were elected for the ensuing year: President, H. T. Sackett, Fond du Lac; first vice-president, E. C. Oviatt, Columbus; second vice-president, P B. Wright, Milwaukee; secretary, W. H. Mueller, Madison; treasurer, Adolph Gropper, Milwaukee.

The next meeting will be held at Oshkosh in July, 1905.

W. H. MUELLER, Sec'y.

Madison, Wis.